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ORIGINAL LECTURES.

CLINICAL LECTURE
ON THE TREATMENT OF SUMMER COMPLAINT.

Delivered at the Medico-Chirurgical Hospital of Philadelphia

BY WILLIAM F. WAUGH, A.M., M.D.,

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THE treatment of summer complaint, or cholera infantum so called, has not been hitherto very satisfactory by the methods usually employed. Mild cases recover under the most varied methods of treatment, while severe cases in unfavorable weather usually die. In all forms of the disease it must be admitted that well-directed hygienic management of the individual and his surroundings is of the first importance. As organic substances decompose rapidly in hot weather, the utmost care should be taken to remove all animal and vegetable impurities from the premises and immediate neighborhood. In one of my cases, where the family resided near the Delaware River, every rise of the tide filled the house with the effluvia from the cesspool, which communicated directly with the river by means of an untrapped drain. This child improved every day while absent from home at the Sanitarium, but became worse when brought back to the house for the night. Another child, it was noticed, was worse whenever it was taken into the kitchen, where one wall was constantly damp from the leakage from a neighboring vault.

The custom has heretofore been to rely mainly upon milk as the proper food, if not the only food, for infants. The investigations of Vaughan, resulting in the discovery that the poisonous tyrotoxicon can be generated in milk under certain conditions, have cast a serious doubt upon the innocuity of this food. Apart from this, it would seem *a priori* that a more unsuitable food for infants in hot weather could scarcely be found. Leaving out of consideration the question of the communication of disease from the animal supplying the milk, and the adulteration of it, especially with impure water from barnyard wells, it may be noted that, of all animal products used as food, milk is the most prone to decompose and to absorb poisonous emanations from surrounding sources. Should you place a pan of fresh milk in a refrigerator with a bit of tainted fish, in an hour you would find that the milk will not only have taken up the odor of the fish, but will have acquired its poisonous properties; so that any person drinking the milk will be as likely to have cholera morbus as if he had eaten the spoiled fish. To this proneness to decomposition, if we add the confessed necessity of absolute *surgical* cleanliness in preparing the milk for the child's use, it may well be said that a more dangerous food—for city children, at least, in hot weather—could not readily be devised.

My experience with summer complaint previous to the present summer has not been satisfactory. Several times I thought that I had found a remedy, but subsequent experience did not fulfil my first anticipations.

In summing up the treatment of this disease, Meigs and Pepper give a formula containing "Haller's acid," and state that the authors intend to "give it a trial next summer." That final sentence speaks volumes of the utter failure of the methods used previously, and of the realizing of the necessity for some more efficient agent; and yet of the unwillingness of the physician, when confronted with a desperate case, to trust untried remedies. I have known scores of physicians who, at the close of a disastrous summer, were going to try "Haller's acid" next season; but the first serious case of next summer found them back at their calomel, bismuth, etc.

I have tried Haller's acid, and found it possess no properties superior to the aromatic sulphuric acid.

When the present season opened, I determined to adopt a different system from any I had previously used. First, I excluded milk rigorously from the food of every child who suffered with any form of bowel disorder or "summer complaint." I restricted the diet to the white of egg mixed with three times its bulk of cold water, with stale bread toasted in the oven until a rich dark-brown color throughout, and then rolled into a powder and softened with boiling water. In some cases I gave Lactated Food, and in one Malted Milk, each with good results. I endeav-

ored to obviate the exhaustion due to sweating, by restricting the amount of fluid imbibed, and by giving plenty of salt with the food. To diminish the effects of excessive heat, I ordered a tub of tepid water to be placed in the middle of the room, and the child allowed to get into the water whenever he desired, and remain in it some minutes. In one case the improvement began with the first bath.

The choice of medicinal agents will, of course, depend upon the view taken of the pathology of the disease.

Hayem has recently given the results of some very interesting investigations upon the nature of the green diarrhœa which is so common in the French foundling asylums. He found that this green diarrhœa disappeared most promptly when lactic acid was given in doses of six to nine grains daily; that the disease very uniformly reappeared until the precaution was taken of disinfecting the stools as soon as they were voided, by placing them in a solution of corrosive sublimate (one to one thousand). These measures completely eradicated the disease from the institution, and it did not reappear until a new child entered who brought the affection with it. In every case it was found that strict enforcement of the antiseptic precautions caused the disappearance of the diarrhœa.

A microscopic examination of the green stools revealed the presence of a peculiar microbe, to which Hayem attributes the disease. To this I attach but little importance, as the modern bacteriophile who goes hunting with his little microscope rarely fails to bring home game.

But there are other reasons for considering it probable that the symptoms of summer complaint are really due to the circulation in the blood of a poison generated by micro-organisms in the gastro-intestinal tract.

We have learned to associate the hot head, icy extremities, intense fever, and abdominal pain occurring in puerperal cases to the presence of decomposing substances in the uterus. We know also what prompt relief follows the removal of these noxious matters. Such relief could not be obtained were the symptoms due to the presence of microbes in the blood, and the fact that the relief does occur shows that the generating cause is removed.

So, also, in severe cases of naso-pharyngeal diphtheria, with the frightfully fetid breath we have constitutional symptoms markedly resembling those of puerperal septicæmia. There is the same intense fever, the burning forehead, and icy feet. The relief which follows a thorough cleansing of the throat and the nasal cavities is greater than would be believed possible by those who have never taken the pains to do it. That this relief is not always lasting, as it is in puerperal septicæmia, is due to the fact that in diphtheria there is a true migration of bacteria into the blood, where they multiply undisturbed by our therapeutics.

Now, in severe cases of summer complaint we have a train of symptoms strikingly similar to those of the two diseases just mentioned. We have the intense fever, burning head, hot and tender abdomen, cold extremities, and stools whose fetid odor gives evidence of decomposition.

Few children die of diarrhœa except when chronic enteritis remains after the subsidence of the acute attack. Death is usually due to fever, with symptoms of hydrocephaloid or cerebral paralysis.

Taking this view of the pathology of summer complaint, we have a definite basis for our therapeutics. We need no longer wage a guerilla warfare, a little war of outposts and detachments, but we can bring the matter at once to issue in a pitched battle. We can attack our as yet unknown enemy by throwing germicidal shells into his camp.

As we are ignorant of the peculiarities of this particular germ, we can only ascertain the most suitable germicide by experiment. I concluded to begin the season with the sulpho-carbolate of zinc, and not to lay it aside until I had demonstrated its inefficiency. Thus far the success of the method has been such that no reason for a change exists. Out of nearly thirty cases treated by myself and Dr. Taylor there have been no deaths. These cases covered every grade of the disease, including catarrhal gastro-enteritis, inflammatory entero-colitis, and true cholera infantum. At first the zinc salt was given in doses of $\frac{1}{16}$ grain every two hours, with one to five grains of bismuth. As the remedy was well borne, the dose was increased to one-fourth grain for a child in its second summer. The first and invariable effect has been to stop the vomiting. The stools became less offensive, although

in some cases they continued to be copious and frequent. In these cases we gave enemata of flaxseed tea containing five grains of the sulpho-carbolate and half a drachm of bismuth. This proved effectual in all cases.

Intense fever was met by antipyrine in doses of one to two grains. This drug appears also to have a disinfectant action upon the stools.

When the child has improved somewhat, mutton-broth with rice has been added to the diet; then weak coffee, brandy, meat (to be sucked), especially salt meat, and chicken jelly.

Whether this plan of treatment will withstand the test of subsequent experience remains to be seen.

The sulpho-carbolate of zinc has the advantage over naphthalin and salicylic acid of being more palatable and less irritating to the stomach. Antipyrine has the same advantages over quinine, when an antipyretic is required. That the bismuth had but little action except as a vehicle we proved by occasionally giving it without the zinc salt.

ORIGINAL COMMUNICATIONS.

REVIEW OF PROGRESS IN MEDICAL AND SURGICAL ELECTRICITY.

BY WILLIAM R. D. BLACKWOOD, M.D.

GALVANO-CAUTERY IN UTERINE AFFECTIONS.

A SYNOPSIS of results obtained in diseases of the endometrium and in fibroids was lately given in the *British Medical Journal*, the methods employed being those of Apostoli principally. Dr. Lucien Carlet embodies the result of this plan in a monograph, "Du Traitement électrique des Tumeurs fibreuses de l'Utérus," and Apostoli follows in another, "Sur un nouveau Traitement de la Métrite chronique, et en particulier de l'Endométrite, par la Galvano-caustique chimique intra-utérine." Full histories of several hundred cases are given, and the conclusions drawn may be thus summarized:

1. The method is essentially the application of a constant and continuous current to the uterus.

2. The seat of application is always the whole extent of mucous surface.

3. If the cavity is unattainable, a puncture is made, followed by galvano-caustic action, thus making an artificial channel.

4. The active intra-uterine pole must always be positive in hemorrhagic fibromas or in accompanying obstinate leucorrhœa; negative in dysmenorrhœa.

5. The greatest possible strength must be used up to the limit of toleration,—one hundred to two hundred and fifty milliampères.

6. From five to ten minutes must elapse before effective cauterization is attained.

7. The applications are repeated according to the size and solidity of the tumor or extent of diseased tissue, generally bi-weekly.

8. The presence of active hemorrhage is not a contra-indication for electrolysis.

9. To overcome pain or eschar, the abdominal electrode is of potter's clay applied over a wide surface.

10. The operation is virtually a cauterization with a high degree of electro-chemical action.

11. Proper applications bring about rapid elimination of fibroid tumors; hemorrhages are arrested, and health is assured.

For some years past we have advocated strong currents as perfectly safe in pelvic work, although the profession has tied itself down to a maximum of forty to fifty milliampères. Apostoli goes up to two hundred and fifty milliampères, and we have repeatedly excelled that by one hundred milliampères without injury.

Dr. Woodman Webb reiterates all the above in a published letter, after observing the practice of many operators and comparing results in electrolysis with the usual surgical procedures. Many interesting communications on this subject appear in the *British Medical Journal* for May, June, and July, by eminent authorities.

In some rare cases galvano-cauterization is not immediately applicable. These exceptions are of three kinds: those of extreme temporary excitability (hysterical); those called by Apostoli "*entérite glaireuse*;" and those presenting a subacute form of perimetritis. Such conditions must be overcome by appropriate treatment prior to employing electricity. Occasionally perfect intolerance is observed, according to Webb and others.

This we do not for a moment believe, as the physical operation of electrolysis is available in any case despite any or all nervous accompaniments. Under anæsthesia, any needed electrical procedure is readily carried out, and hysterical complications cannot in any degree influence the result of such treatment. With delicacy of manipulation, knowledge of the physics involved, and definite diagnosis, no danger is possible.*

ELECTROLYSIS IN CYSTIC OVARIAN TUMORS.

Dr. Semeleder has read before the Academy of Medicine of Mexico a memoir reporting the results in forty-five cysts treated by electricity, the outcome of which was so satisfactory as to lead him to endorse strongly the procedure before resorting to the ordinary enucleation by abdominal section.

ELECTRICITY IN LACTATION.

Aubert (*London Medical Record*) alludes to the use of faradism in undeveloped mammary glands after parturition, and strongly advocates its value. In one instance two applications secured a full supply of milk, and other cases are noted.

Becquerel relates the case of a woman who, after eight days' suppression, was able to nurse her baby, and in whom the quality of the milk also was improved. The suppression resulted from intense mental emotion.

Pierron supports the above testimony by relating the notes of a large number of cases occurring since 1884 in his practice, in which electricity either re-established the function after suppression or induced it when absent after normal labor.

As heretofore stated, we have found static electricity always reliable as a galactagogue after the failure of all other procedures; but faradism will, of course, be available in any case where electricity is indicated. To be efficacious the treatment must be prompt and thorough, both breasts being included in the circuit at each sitting.

ELECTRICITY IN TEDIOUS LABOR, AND IN POST-PARTUM HEMORRHAGE.

The patient, a primipara, 23 years of age, suffered with albuminuria and excessive œdema. Uterine contraction was feeble at first, and then entirely absent. After twelve hours of fruitless effort to establish pains, an interrupted current was used, and labor terminated satisfactorily. Some two hours later hemorrhage occurred profusely, and, failing with vinegar, hot water, etc., the doctor again used the battery. Contraction was readily secured, and the bleeding did not recur.—*Guice de Fayette.*

ELECTROLYSIS IN ANEURISM.

Dr. Robert Abbe has recently reported the results of Barwell's method of treating aortic aneurism by the introduction of coils of fine wire and the subsequent passage of an electric current. In cases referred to in the practice of others, the tumors became solid, but the great defect appears to be in delaying until the sac is extremely thin and ready to rupture. Neither suppuration nor embolism has been noted thus far in any instance, and the formation of a firm clot is apparently obtained more certainly by this method than by the simple introduction of horsehair, catgut, or wire. As thoracic aneurisms are certain to progress, would it not be well to try the electrolytic plan as here described before the tumor has grown much, and whilst its wall is firm? The operation is within the ability of any practitioner owning a battery.

Obelar relates a case of aortic aneurism with horribly painful angina, in which galvano-puncture with twenty cells was employed. The needles were separated about one inch. The dysphagia was relieved, the general health renewed, but the tumor was only restrained from growth for a month.

Brancaccio relates a similar case in which four applications enabled the patient to return to his work. Dying from pneumonia three years later, a post-mortem disclosed a sacciform dilatation the size of an orange, completely filled with a firmly-organized clot, which could not be penetrated by the finger. The wall of the aorta was elsewhere sound, and in this instance the cure by electrolysis was proven. —*London Medical Record.*

DANGER OF ELECTRICITY IN OPIUM-POISONING.

In a paper read before the New York Academy of Medicine recently, Dr. Andrew H. Smith referred to the application of electricity to the phrenics in the neck in severe opium-poisoning. Dr. W. H. Thomson warned those present against in-

* See New York Medical Record, August 13, for latest report by Apostoli.

discriminate electrical applications about the throat, as did also the late Dr. Gasper Griswold. In a contribution elsewhere* we adverted to the necessity of care in direct electrization of the heart, and our remarks were based on known instances of improperly-conducted applications, in some of which serious damage was done. The danger in such cases is specially to be guarded against in dispensary and hospital work, in which the resident-physicians have had little practical experience with electricity, and the safest plan then is to gently stimulate the thoracic muscles by rapid labile applications, with an occasional touch over the solar plexus. In either instance one pole may be placed at the nape of the neck, and the other used as indicated. Electricity is not nearly so serviceable in opium-poisoning as the general opinion holds it to be, and, although we have frequently used it with advantage, we value the usual antidotes much more.

ELECTROLYSIS IN VASCULAR NÆVI.

Pitoy has obtained very satisfactory results in this form of dermic lesion through galvano-cautery, and with but little cicatricial marking. He advises the use of small platinum needles, and always makes the distance between the points of entry and exit not more than eight millimetres. When a distinct white zone is produced between these points the needle is withdrawn. If removed sooner, hemorrhage is liable to ensue. (*Annales de Derm. et de Syph.*, vol. viii. No. 1.) The reason why disfiguring scars so often result from cautery in nævi, in our opinion, is that too much electric force is used, and bleeding is produced by inserting the needles too deeply and removing them before the characteristic white surface is produced. The needles should also not be too fine, as it is difficult to induce whitening over a sufficiently large area at one sitting unless they are thick, and ulceration likewise is more apt to follow cautery with very small puncture at high heat.

GALVANO-CAUTERY IN SALIVARY FISTULA.

Dr. George Buchannan reports in the *Glasgow Medical Journal* the case of a lady suffering with a fistulous tract following an enormous carbuncle of the neck below the ear. The incision made left a sinuous tract unhealed for thirteen years, through which saliva flowed at each meal during mastication. The whole length was cauterized by the loop, and it healed firmly in two weeks, with little scar.

TREATMENT OF ENLARGED TONSILS.

Drs. Knight and Robinson, of New York, advocate strongly galvano-cautery in enlarged tonsils, with special reference to cases promising much hemorrhage. The former obtains definite cures with few sittings, although the rule is that the process is slow in most hands. Our plan for a long time has been to paint the tonsil with strong carbolized iodine before puncture, and to go into the centre of the gland in half a dozen places at each operation, allowing three days to elapse between dates. Neither hemorrhage nor sloughing has ensued, and we believe the method a good one where the patient objects to cutting or where bleeding is feared. Cocaine is also used of late.

ELECTRICITY IN ANGIOMA.

Dr. Julian Alvarez speaks very favorably of electricity in the treatment of angioma, and, using Onimus's apparatus, he plunges the positive electrode into the tumor, whilst the negative is moved about either over the mass externally or as close to it as possible. He gives excellent results in a large number of cases.—*Revista Balear.*

HYDRO-ELECTRIC BATHS IN NERVOUS AFFECTIONS.

Dr. R. Wagner, of Giessbach, describes several cases of neurasthenia, cardiac neurosis, etc. (*British Medical Journal*), in which his conclusions are that bipolar baths (galvanic and faradic) have these advantages:

"1. They possess special power as sedatives in excitable patients of neurotic tendency.

"2. Sleep, appetite, and the general tone are improved more readily thus than in any other method.

"3. The pulse-frequency being diminished during the baths, they are therefore to be strongly advised in angina pectoris and other cardiac neuroses."

Even were electric baths of value in any case whatever (which we doubt, beyond the effect on the imagination), the employment of them in angina would be fraught with danger, and the unavoidable delay in preparing the bath in acute at-

* Review of Progress in Medical and Surgical Electricity. Philadelphia Medical Times, July 10, 1886.

tacks would be criminal. Nitrite of amyl is the remedy, and arsenic in the intervals is better than electricity in any form.

FARADISM IN CHRONIC LARYNGITIS.

In persons who as vocalists are obliged to use their voice before thoroughly cured, faradism is found by several specialists to be of special value. At the recent meeting of the American Laryngological Association this point was sustained by several speakers. In conjunction with mild astringent sprays some four hours before using it, the voice is readily toned up by faradism, although complete rest is advisable after the emergency is past.

STATIC ELECTRICITY IN THE TREATMENT OF DISEASES OF THE SKIN.

For the past year Dr. Frank B. Carpenter, of New York, has been using static electricity in the treatment of diseases of the skin. He has found it particularly useful in diseases of the skin of neurotic origin. In seven consecutive cases of alopecia areata treated by that method exclusively, the hair ceased to fall after a few applications, and new hair soon commenced to grow. The more recent the cases, the more rapid was the improvement. The duration of the disease in these cases varies from three months to eighteen years. The youngest patient was ten years of age; the oldest was thirty-eight.

In the treatment of three cases of alopecia præmatura by the same method, the results were sufficiently encouraging to warrant the belief that static electricity will not only prevent the baldness, but will restore the hair when it has already fallen.

In five cases of zoster treated only by the static current, the neuralgic pains were much diminished. It appeared to check the eruption, preventing the formation of vesicles when used early in the disease, and causing them to desiccate, thus forming a protective covering when the vesicles had already formed.

In several cases of severe pruritus genitalium, more satisfactory results were obtained than by any other method of treatment he has used. He has found it of use in the treatment of lichen planus and dermatitis herpetiformis.

The reviewer has during the last eight months been trying a series of experiments with static electricity and faradism in alopecia dependent principally on debility consequent upon fevers. So far success has been encouraging, much more so than that otherwise secured by stimulating hair-tonics. He has not found it necessary to cut the hair or to shave the scalp, as is usual where the hair falls profusely. A rheophore saturated with distilled extract of witch-hazel is used on the scalp, and it is closely applied, the spark occurring at the discharging-rods of the machine.

Reference has been made in these columns before as to the value of electricity in pruritus and in herpes zoster.

THE PROJECTION OF PARA- AND DIA-MAGNETIC MOVEMENTS OF LIQUIDS.

Ricco gives the following simple method of illustrating the different effects produced by the electro-magnet upon para- and dia-magnetic liquids. The rays from a candle are collected by means of a convex lens and reflected from the plane surface of the liquid to be tested, the image being received on a white screen. The current is then turned on. If the liquid is amagnetic (or neutral), no effect is produced; otherwise the image is scattered or confused. If the liquid is para-magnetic, the image can be caused to reappear by bringing the screen nearer the liquid surface or by removing the lens, and the new image will then be drawn out, indicating the cylindrical formation of the liquid surface. When the liquid is dia-magnetic, the image reappears on removal of the screen to a greater distance or upon the substitution of a shorter focus-lens, thus proving the convexity of the liquid surface.—*L' Elettricita.*

GALVANISM IN EXOPHTHALMIC GOITRE.

The patient, æt. 28, a nurse, under the care of Dr. W. B. Hadden, of London (*Braithwaite*, July), with extreme exophthalmos and much suffering from pressure on the trachea, had been unsuccessfully treated by drugs. The current (galvanic) was passed from the nape of the neck to the thyroid and eyeballs—strength not stated—for ten minutes twice daily. The cure occupied a month, and no return of the disease was noted after prolonged observation. In a paper by the reviewer* on this subject, the efficacy of galvanism

* Philadelphia Medical Times, April 23, 1881.

in severe cases was shown, and none of the cases narrated in that paper have had a return of the disease in the six years which have passed. Nothing except electricity is used in such cases, provided the patient is strictly under our care; and several interesting examples have been treated since the publication of the paper referred to. The method used is: positive to the cervical pneumogastric, negative to the solar plexus; thirty to seventy-five milliampères for fifteen minutes daily.

WAKING NUMBNESS.

Within six months past a few cases of this rare affection have been reported, and to these may be added two coming under the charge of the reviewer.

The first, a gentleman of decided nervous type,—a bank clerk,—was troubled for some four years, at first at intervals of a month or more, but recently every two or three days. The anæsthesia covered the abdomen and one-half of the right lateral thorax, and the sensation was that of deadness. The skin was decidedly benumbed as to sensation, and sharp pricks with a pin were not felt if the eyes were covered. The phenomena commenced on waking, and lasted from ten to forty minutes. No gastric or renal disorder was discovered. The patient was referred to me for electrical treatment by his family physician.

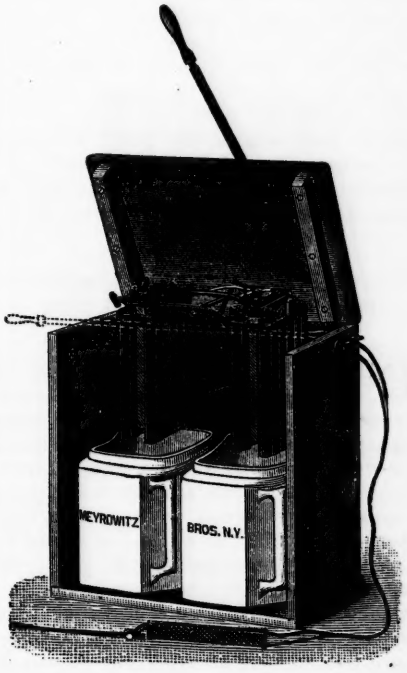
The second case was that of a young lady in my own practice. She was apparently in vigorous health. The disorder had lasted three weeks when I took it in hand. The sensation was such as prevails after pressure upon any large nerve. She was not anæsthetic so far as painful tests were concerned, and there was hyper-excitation after the disappearance of the numbness. The sensation was confined to the thigh and hypogastric region of the left side. It lasted about ten minutes after rising in the morning. In this case pressure over the left ovary at any time precipitated an attack, which, however, would last some five minutes or less. She always slept with the limbs extended: hence pressure could not be the determining cause whilst asleep.

Galvanism cured both patients,—central applications with the male, and positive to the ovary with negative to the foot in the female. From fifty to one hundred milliampères were given for fifteen minutes daily in each case. The first required a month's treatment, the second ten days only.

NEW GALVANO-CAUTERY BATTERIES.

Mr. A. F. Fleishmann, of this city (1812 Market Street), has devised an ingenious modification of the Bunsen type for cautery purposes. The apparatus consists of six cells with multiple plates, and the commutator couples either for quantity or intensity as may be desired. Any degree of immersion is attainable by a ratchet mechanism, and either or all of the series of plates may be employed at one time. A careful test maintained the cautery electrode at a definite heat for two hours continuously, and the battery requires very little attention.

Messrs. Meyrowitz Bros., of New York, have presented a cautery apparatus with novel features. The cells are accessible



from the front of the case: they are readily emptied without spilling, from their possessing a handle and lip, and the plates are submerged or raised by an ingenious lever-movement. The action is very prompt, and polarization is avoided to a great extent. Of the many new types, this is an exceedingly desirable one for

galvano-caustic purposes or where quantity-currents are desired.

NEW BIPOLAR ELECTRODE.

At a late meeting of the Paris Academy of Medicine, M. Dujardin-Beaumetz presented an electrode devised by Professor Apostoli for localizing currents. The olivary point is carbon, divided in the median vertical line by a thin insulating strip of gutta-percha, and from its construction it is incorrodible. It is evident, however, that no such use as that of a cautery instrument could be made of it, as the insulation, whether of vulcanite or gutta-percha, is readily destroyed by low heat.

INCANDESCENT SEARCH-LAMP.

Dr. Dent, of St. George's Hospital, has had Messrs. Woodhouse & Rawson, the eminent London electricians, make for him an incandescent lamp of high power within small compass, which is specially valuable in abdominal surgery. The low temperature allows the globe to be placed within the cavity, so as to render translucent the omentum, the bowel, etc., and thus add to the sense of touch that of sight. One side of the globe is frosted to prevent dazzling, and the bulb and conductors can be bathed in sublimate or other antiseptic solutions with impunity.

THE TOXIC AGENT IN CASES OF POISONING BY ICE-CREAM.

BY GEORGE S. HULL, M.D.

DURING the past few years cases of ice-cream poisoning have been quite frequently reported, and there have been numerous investigations into the cause of the trouble. As far as the writer has been able to follow the literature of the subject, no *one* theory seems to be sufficiently plausible to be accepted as correct. Among the numerous reasons given by experts the following are most noteworthy: keeping the milk or cream in unclean vessels, especially in copper cans; exposing it to a polluted atmosphere; obtaining it from cows that have been improperly fed or cared for; and, finally, adding corn-starch, etc., to it, and allowing fermentation to set in, thus generating ptomaines by reason of the micro-organisms present. The latest and most generally liked theory is that advanced by Professor Vaughan, whose careful study of tyrotoxicon has given him such deserved prominence. The interesting history of the discovery of this poisonous compound, its simple manner of isolation, and the skilful and painstaking analysis of it, which proved it to be diazobenzol, are all too well known to be repeated. However,—and without attempting to array myself against this theory,—I wish to mention a few facts which seem to militate against the supposition that ice-cream poisoning is most generally due to the presence of this ptomaine.

The peculiar ferment or micro-organism which generates tyrotoxicon is not yet known, and even the precise conditions under which it develops have not yet been ascertained. It is true that milk containing the micro-organism will, when added to pure milk and kept at a temperature of about 98° with a limited supply of air, readily inaugurate the process which generates this particular ptomaine,—which, however, is said to be ephemeral, further fermentation breaking it up into other compounds; also, a temperature much less than that of boiling water destroys it, and a freezing temperature, while not fatal to its production, certainly should not be favorable to the micro-organisms which are said to generate it.

It would seem reasonable that milk, which is consumed in such vast quantities, and which is so carelessly handled as regards proper temperature, clean vessels, and pure atmospheric surroundings, should very frequently be put in the very conditions (we know not precisely what they are) which would favor the development of the micro-organism and the consequent production of the tyrotoxicon; and then that very often it should be taken into the stomach just when the poisonous ptomaine was most abundantly present, and before it could undergo further change and become converted into other and perhaps less harmful compounds. All this seems highly probable, and the result should be the quite frequent poisoning of people from drinking milk. Now, whether this actually be the case or not, the fact is that the *reported* cases of ice-cream poisoning are out of all proportion to the ratio of consumption of milk to ice-cream,—unless we believe cholera infantum to be due to the ingestion of tyrotoxicon, as has been suggested.

Let us see whether the conditions which are so favorable to the formation of tyrotoxicon in milk obtain in any like degree

in the manufacture of ice-cream. It is well known that most ice-cream mixtures are boiled before being subjected to the freezing process, thus destroying any micro-organism present; this is the case particularly when corn-starch, gelatin, etc., are components. After the mixture is subjected to the low temperature of freezing, the likelihood of the formation of germs is very much lessened, although this condition may not be fatal to micro-organisms which may have been developed previously and not destroyed by boiling. So we have reason to believe that the conditions which so much favor the formation of tyrotoxicon in milk do not exist in nearly so great a degree as regards ice-cream. I am aware, however, of the fact that ice-cream, after being sterilized by heat and put into the freezer, may be allowed to melt, and after a time be re-frozen, thus being placed in a condition which may favor the production of tyrotoxicon; or the rancid butter adhering to some carelessly-cleansed cans may start the process by reason of the butyric acid present.*

I merely present the above brief reasoning to bring out the anomalous condition of affairs which must hold if, after eliminating cases of poisoning in which foreign poisons have been maliciously added to ice-cream, tyrotoxicon should be urged as the sole cause of the trouble; and I repeat that, considering how little ice-cream is consumed compared with the quantity of milk used, the ratio of the cases of poisoning seems out of all proportion. This thought is what led the writer to devote some time to the study of this interesting and important subject, and to the performance of numerous experiments with various ice-cream mixtures,—a brief notice of which has already gained publicity.

As there could be found no reports of investigations as to what went on within the freezer during the process of freezing, it was determined to confine the study to this part of the subject; to examine closely the modern ice-cream freezer, and to see if the ice-cream mixture, after having been proved to be pure and innocuous before being put into the freezer, *could generate any poisonous substance during and after the process of freezing.*

Upon looking into the construction of the modern ice-cream freezer, I found it, with very slight exception, to consist of a zinc-coated paddle and a tin or copper can; the bottom of the can was in most cases heavy iron coated with zinc. Here, it struck me, was a first-rate galvanic cell: zinc the positive element, and tin or copper the negative. The elements also were in contact. It was only necessary to find out how good an electrolyte the ice-cream mixture as variously made was, in order to ascertain the proportion of zinc dissolved in each case. A miniature ice-cream freezer was constructed and numerous experiments performed. Instead of the dissimilar metals being in direct contact, as in the freezer, they were connected by a copper wire and a moderately sensitive (astatic needle) galvanometer introduced into the circuit. It was evident that if the galvanometer-needle was at all deflected it would indicate that a current of electricity was passing, due to chemical action between the zinc and the mixture within the freezer; that the zinc was being dissolved; and, further, the amount of deflection would indicate the degree of chemical action, *because the current causing the deflection would be in proportion to the amount of chemical action.* By this means we could find out which ice-cream mixtures would dissolve the most zinc, and so become the most dangerous to the consumers.

In order to institute a comparison between the different ingredients used in making ice-cream, pure cream was first tested. At 32° F. it caused a deflection of seven degrees, showing that the zinc was being dissolved to some extent. The following table will give an idea of some of the results obtained:

Distilled water	No deflection.
Hydrant water	8 degrees.
Cream, sweet (unfermented)	7 "
" sour (fermented)	90+ "
Milk, sweet	40 "
" sour	90+ "
Equal parts of milk and cream, sweet	25 "
" " " sour	90+ "
" " " with sugar and vanilla—sweet	58 "
Equal parts of milk and cream, with sugar and vanilla—sour	90+ "
Equal parts of milk and cream, with sugar and corn-starch—sweet	45 "
Equal parts of milk and cream, with sugar and corn-starch—sour	90+ "
Equal parts of milk and cream, with sugar and eggs and corn-starch—sweet	80 "
Equal parts of milk and cream, with sugar and eggs and corn-starch—sour	90+† "

* Professor Vaughan claims that the bacillus butyricus, or some ferment which develops along with it, will inaugurate the process.

† By 90+ is meant that the needle is deflected to a right angle to the current, and the only comparison that can be made between mixtures which cause such amount of deflection is by noticing the force with which the needle swings past this point. By using a less sensitive instrument these acid mixtures could readily be compared.

The fruit ice-creams caused deflections of from fifty to ninety plus degrees when sweet (unfermented), as also did the water-ices. I have endeavored to embody in the above table the most common forms of ice-cream mixtures, so as to give an idea of what can be found out by using the galvanometer in this way. It will be noticed that pure cream has the least action upon the zinc, and if ice-cream, as its name leads one to infer, were *always* made from *pure cream*, there would be but little cause for alarm.

These figures go to show *most positively* that the ice-cream which causes most deflection of the needle is the one which dissolves most zinc, and hence is the one most likely to cause poisoning. Another conclusion easily arrived at is that the longer the zinc is in contact with the material in the freezer the larger the quantity of the zinc dissolved.

Now it is in order to explain why, if zinc is always dissolved in some degree by ice-cream as made in the modern freezer, ice-cream poisoning is not more general, and why it breaks out violently at times and produces wholesale poisonings. I would volunteer the following. Ice-cream is ordinarily frozen in from ten to thirty minutes; then the paddle taken out and the mixture "packed" and set aside to harden. This, unless the mixture is quite acid, is too short a time in which to dissolve very much zinc, and so generally no bad results follow. And yet there are not a few persons who complain that ice-cream but seldom agrees with them; it disorders their sensitive stomachs, they know not why. However, when the mixture is put into the freezer warm and allowed to stand awhile before being frozen (high temperature being more favorable to the chemical action); or when a number of freezers are prepared and frozen one after another (allowing the zinc in the last to be a long while in the mixture); or when the mixture is "turned" (one manufacturer told me he could make smoother and better ice-cream if the mixture was "a little bit sour"); or when acid fruits are present; or when the ice-cream has been allowed to melt and partially ferment, and then have fresh material added to it and be refrozen; and *especially* when salt by any mishap gets into the freezer (I have been told that small quantities of salt are sometimes added to certain ice-creams to improve the taste); then we have favorable conditions for the formation of poisonous salts of zinc.

In looking into the recorded cases of ice-cream poisoning, it is noticeable that most of them have occurred at picnics, at banquets, on holidays, etc. For picnics the ice-cream is generally made the day before, and the paddle, it is likely, allowed to remain in over-night, so as to refreeze in case of too much softening; thus allowing plenty of time for the chemical solution of the zinc. The large manufacturer may have a superabundance of orders for a holiday; he makes quantities of the ice-cream mixture and puts it into his freezers, there to await its turn at having the power applied for freezing, and the family who get the contents of the last freezer are in great danger of being poisoned. It has been proved long ago that well- or spring-water will dissolve small quantities of zinc, especially when chlorides are present.*

Milk also has been shown to act upon the zinc vessels which contain it,† and it has been the object of this paper to direct attention to the fact that dangerous amounts of zinc may be dissolved, *owing to the faulty construction of the modern ice-cream freezers.*

These facts go to show that in order to prevent metallic matter from being dissolved, no metals forming poisonous salts should be placed in contact and kept in any liquid intended to be taken into the stomach; also, that any metallic vessel which is to hold liquids for human consumption should be of one kind of metal, and that in its purest state, as other metals, if present in it, will set up local action, and thus cause a more rapid solution of the positive element. Indeed, in order to be thoroughly safe, all metals which form poisonous salts with ordinary acids should be avoided in the construction of such vessels.

While upon this theme, I might direct fresh attention to the fact that the harmless (?) soda-water is guilty of dissolving deleterious quantities of lead, etc. Beer, also, which is kept in zinc-lined vessels

* Zieurek found in water contained in a zinc cistern no less than one drachm of zinc to the gallon. The same water showed only six grains of sodium chloride to the gallon.

† M. Schaufféle, by keeping milk in a zinc vessel for fifteen days, found that the zinc was dissolved to the extent of three hundred and fifty grains to the gallon; while, when kept for the same length of time in a zinc-coated (galvanized-iron) vessel, four hundred and eighty grains to the gallon was the amount dissolved. This latter fact is significant in this connection.

with copper or brass spigots may add sufficient mineral poison to the other poisons it already contains to become extra-hazardous. Even the innocent buttermilk may suffer serious contamination in the same way.

Dentists, all unconscious of the distinction, may, I have thought, be called "practical electricians," because they are constantly putting small galvanic cells into the mouths of their patients. Plugs of gold, silver, and "amalgam" (tin, silver, and zinc rubbed up with mercury) are put into the same mouth, to be bathed by the saliva (a fair electrolyte), thus constituting galvanic cells, and frequently the dissimilar metals are brought into contact, the result being a small current of electricity (sometimes strong enough to be felt) and the solution of some metal, which is generally swallowed; but this is probably too trifling to merit much attention.

Fruit-cans have tin and lead (solder) in contact, and as these are exposed to the juices of acid fruits we may readily estimate the danger; we know something of the sickness caused by canned fruits. In order to show the mischief worked in other directions, I will mention one of many instances. Machinists often complain of their inability to keep copper or brass tubes which are fitted into iron boilers perfectly tight; the steam in time will leak out. Here we have iron and copper as the two elements, and, if the water in the boiler contains saline matter, we have a galvanic cell on a small scale, but sufficient in time to eat away enough metal to cause a troublesome leak.

In conclusion, I desire to state that there is no intention to claim that ice-cream poisoning is *always* produced in the way I have detailed. I merely wish to offer the thoughts of this paper as additional to what has been advanced on the subject. The tyrotoxicon theory will help explain those cases of ice-cream poisoning in which the mixture has not been boiled or has been allowed to melt after having been frozen; and the theory which the writer has outlined may help explain what remains.

It might be well to add that where tyrotoxicon is present the zinc salts should the more abound, as the ptomaine is developed in an acid mixture, and acid fluids are most favorable to the solution of zinc.

CHAMBERSBURG, PENNSYLVANIA.

REMARKS ON THE BACILLUS OF LEPRA, WITH MICROSCOPICAL PREPARATIONS.

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THE specimens from which the preparations shown this evening have been made are chiefly from a case which occurred in Demerara, but of whose clinical history I can learn nothing. There is also a microscopical slide prepared from leprous skin which I obtained in Vienna.

Some understanding of the pathological histology of the disease is necessary before studying the nature and distribution of the micro-organisms.

The infiltration of lepra consists of granulation-tissue, under the microscope much resembling that of lupus, except that it is not so much divided into nests as in the latter affection, nor is there so great a supply of blood-vessels. The deposition of lymphoid cells takes place primarily in the corium, and extends thence along the course of the blood-vessels towards the surface and into the deeper layers of the subcutaneous tissue. The production of giant-cells and the occurrence of retrograde metamorphoses are to be observed both in lepra and lupus.

A preparation from one of the nodules of the Demerara case has been stained with hæmatoxylon and is exhibited under one of the microscopes on the table. It will be seen to be composed of an accumulation of lymphoid cells covered by a thin epithelial layer. There are comparatively few blood-vessels to be found, and the tubercle presents an almost uniform appearance throughout, except for the scattered bands of connective tissue which divide it into poorly-defined lobules. The lymphoid elements are situated in an alveolar net-work, and in many places giant-cells may be observed. A very similar appearance is that of a transverse section made from the terminal phalanx of one of the fingers, in which even the bone has been destroyed by the disease. This preparation is also exhibited under one of the microscopes, and the uniform infiltration of all the tissues below the *rete Malpighii* will be noticed. Around the blood-vessels the cells are gathered in greater numbers,

* Communication read before the Philadelphia Pathological Society.

often forming concentric nest-like groupings. The walls of the vessels are frequently thickened by the infiltration, and a partial obliteration of the lumen is often to be observed, the latter being caused by a proliferation of the endothelial lining.

Other sections of the finger and of the nodule have been double-stained in order to show the *Bacillus lepræ*. The method adopted was the well-known one of Ehrlich for staining tubercle-bacilli, using either fuchsin or gentian violet,—followed in the first case by methyl blue or by the sulph-indigotate of potash, in the second case by Bismarck brown. The best results were obtained with the fuchsin and methyl blue.

The bacilli are usually described as slender, rod-shaped bodies of a length equal to one-half or one-third the diameter of a red blood-cell, often joined end to end in short chains or gathered in bundles, almost invariably lying in the great "lepra cells," and only rarely to be seen in the intercellular tissue. Under one of the microscopes I have placed a slide from the specimens of leprosy obtained in Vienna. This exhibits bacilli corresponding with the usually accepted description. Here the huge lepra cells, crowded with the microbes, are shown to perfection, and no scattered bacilli are to be seen. But in the Demerara specimens shown this evening the micro-organisms are spread throughout the whole tissue, including even the epithelial layer, though here they occur but sparsely. That they are to be found among the epithelial cells, and even in the hair-follicles and in the hairs themselves, had been denied by most writers, but has since been affirmed by Unna,* and later by Touton† and Neisser. You will be able to see them very distinctly among the epithelial cells in the specimens shown this evening. Elsewhere in the tissue they appear to a slight degree massed in regularly round or oval lepra cells, but chiefly free, and either isolated or in irregularly-shaped groups of various sizes. Their occurrence to so great an extent free in the tissues has been claimed by Unna,‡ but has been hotly contested by Hansen, Neisser, and Touton. If true, it removes one of the most characteristic differences between the arrangement of the bacilli of lepra and those of tuberculosis. Unna declares that the lepra-cell never contains a nucleus, and that it is, in fact, nothing more than an aggregation of bacilli held together by mucoid material. The appearance of the bacilli in the specimens from Demerara indicates the probable accuracy of this view. There is too much variation in the size and too great an irregularity in the shape of the aggregation to warrant the belief that they are situated in a cell, and neither nucleus nor cell-wall can be detected.

Unna's method of preparation was somewhat peculiar. The sections, after being stained and cleared in oil, were dried with blotting-paper and then *over the flame* until the oil was evaporated, and were then mounted in balsam. Other specimens were stained, then transferred directly from water to a cover-glass, warmed over the flame to absolute dryness, and mounted in balsam, thus avoiding the use of oil. These methods are said to show the bacilli in unusual numbers. Hansen§ and Neisser‖ believe that Unna's method destroys the cells, and that on this account, therefore, the bacilli have appeared to lie free in the tissue and lymph-spaces. Hansen does not deny that they may lie in the lymph-spaces, but thinks that when properly treated they will be found *in cells* in these spaces. He brings forward other arguments to support his view, among others that the bacilli can never be found in the blood. Neisser makes the same statement. Kobner, however, declares positively¶ that they do occur both in the white blood-corpuscles and in the serum. He finds them free in the intercellular tissue as well as in lepra cells, but never in the epithelial layer.

Although not fully prepared to express an absolute conviction, yet the appearance of the specimens exhibited this evening makes me inclined to adopt the view of Unna with regard to the position of the bacilli in the tissue. I have avoided the special methods of preparation which he employed, and can see no reason why those which I have used should destroy the lepra cells, if indeed these bodies really are of a cellular nature. It is a curious circumstance, too, that while the specimens from Vienna show bacilli in lepra cells alone, those from Demerara

* Deutsch. Med. Zeit., December, 1885, S. 14.
† Virchow's Archiv, civ. 381.
‡ Loc. cit.

§ Virchow's Archiv, ciii. 388. ‖ Ibid., 355.
¶ Virchow's Archiv, lxxxviii. 282.

reveal scarcely any such structures, but are crowded with microbes lying free in the tissues. They have been prepared in precisely the same manner. Whether it is that these cells, or masses of mucus, or whatever they may be, at some time in the course of the disease burst, or in some way become destroyed and spread the bacilli broadcast, I do not know, but it would seem at least possible. Dr. Lyell, of China, says, in a personal communication, that he easily finds the bacilli in the lymph from the leprous vesicles. This seems to be a proof that, even if Hansen's view is correct regarding the position of the microbes in cells in the lymph-spaces, these so-called cells must break down very readily and set the bacilli free.

TRANSLATIONS.

EVOLUTION OF THE TONSILS.—At a recent meeting of the Paris Biological Society, M. Ed. Retterer made the following communication concerning the evolution and constitution of the tonsils in the human subject. Th. Schmidt, Kölliker, His, etc., explain the formation of follicles in the tonsils by the differentiation of the mesodermic cells. According to these authors, the epithelial elements do not take any part in the formation of the follicles. M. Retterer concludes from his observations that this explanation is erroneous, and gives the following description of the evolution of the tonsils in human beings, from the fœtal period to an advanced age.

In a fœtus of three and four months old, the initial phenomena are more particularly the folding back of the epithelium of the isthmus of the throat and the penetration of several invaginations into the chorion of the mucous membrane. As these invaginations become longer a central space is created; moreover, the epithelium with which they are invested remains stratified, and in its evolution gives rise to epithelial globules which undergo all the modifications of keratinization. The chorion becomes thicker where it surrounds these globules, owing to the proliferation of the mesodermic tissue and the accumulation of young connective-tissue cellules, which form cellular laminæ which are traversed from the beginning with numerous blood-vessels. Towards the fifth month the primitive involutions give rise to a series of epithelial buds which appear on their periphery, and principally on their lowest extremity. These buds press from all sides into the mesodermic laminæ, which continue to be the source of an active growth. When the epithelial buds are cut perpendicularly to their axes, they present the aspect of cylinders joined by one of their extremities to the primitive invagination; when they are transversely cut, they present the aspect of epithelial masses surrounded on all sides by young connective tissue. These evolutionary characteristics, which at the onset resemble those accompanying the formation of the nipple, are continued until birth takes place, when the whole tonsillar formation begins to appear on the surface of the isthmus of the throat.

At the age of two or three years, the aspect presented when the tonsils are cut as above described differs considerably from that presented when they are cut in the preceding evolutionary stages. The primitive involutions begin to take the form of cryptæ or diverticulums which connect the interior of the tonsillar mass with the isthmus of the throat. The terminal buds become gradually separated from these diverticulums through the interposition of the mesodermic laminæ between these buds and the involutions from which they proceed. This circumstance is analogous with that observed in the separation of the neuro-axis from the epidermis, and with the manner in which the crystalline and the auditine vesicule are isolated and detached from the corneal layer through the interposition of a mesodermic layer.

Towards the age of from three to six years, masses which are purely epithelial rarely remain in the connective tissue. The epithelial masses have not disappeared through resorption or degeneration; they are the centre of an active proliferation. The epithelial buds contiguous at the outset to the connective tissue are gradually penetrated from their periphery by cells and fibres of cellular tissue, which are inserted between the epithelial tracings and separate these from each other. An analogous phenomenon takes place in the development of the liver. At this period, which is characterized by a uniform appearance of the tonsillar tissue (*infiltration diffuse*), closed follicles (*follicules*

clos) begin to develop in the tonsil. These follicles are grouped in one or more series around each diverticulum, which is the remnant of the primitive involution and represents the centre of a tonsillar lobe. The lobes are separated from each other by a septum composed of connective tissue. The appearance of closed follicles results from the more noticeable development of the connective tissue in the space which existed at the outset between the epithelial buds. From thence the connective-tissue stroma extends to the centre of the buds, whilst the fibres of this stroma, being stretched out, form a net-work with larger interstices. The blood-vessels follow this principle and exhibit a similar disposition.

In advanced age the closed follicles diminish in size, and even disappear in certain places. The immediate cause of this phenomenon is the increased number and thickness of the connective-tissue trabeculæ, which invade the mass of closed follicles and give a uniform aspect to the tonsillar tissue. At the same time, empty spaces presenting the form of alveoli are observed. Of these, the most recent enclose cellular *débris*. Under the influence of reagents crystals of margarin appear. This is the final stage of the evolution of the tonsils, characterized by the fatty degeneration of the elements themselves and by hypertrophy of the connective-tissue stroma.

The development and evolution of the tonsils in human beings may be summed up in the following manner: (1) the production of epithelial convolutions and increased thickness of the chorion; (2) the formation and subsequent detachment of the terminal buds; finally, the penetration into each element of the mesodermic stroma and the ectodermic tissue. The existence of follicles only lasts while the separation of the connective tissue is more accentuated in the peripheral portions than in the central portions. The retrogressive stage follows closely upon the fibrous transformation of the stroma, and gives an alveolar appearance to the tonsillar tissue.

EXHALATIONS OF CARBONIC ACID IN INFECTIOUS DISEASES.—At a recent meeting of the Académie des Sciences, M. Arloing presented some remarks on the exhalation of carbonic acid in infectious diseases determined by aërobic microbes and anaërobic microbes. If the microbes are aërobic, they rob the blood-corpuscles of their oxygen, and deprive the tissues of their necessary comburant or agent of combustion (bacillus anthracis, microbe of chicken-cholera).

If the microbe is anaërobic, and acts as such in the organism, then oxygen should be a hinderance to the manifestation of its properties (gangrenous septicæmia). Between two animals which succumb, one through the inoculation of the aërobic microbe, and the other through the introduction of the anaërobic microbe, important differences are met with in respect to the intensity of respiratory combustion.

The diseases which M. Arloing chose for these experiments are affections which sometimes attack the human species: malignant pustule and gangrenous septicæmia. In these two diseases M. Arloing found that the quantity of carbonic acid exhaled diminished during the course of the malady, and especially during the few hours before death. In the case of malignant pustule the modification appeared to begin with the first effects of inoculation; while in gangrenous septicæmia there is for a few hours a slight augmentation in the quantity of carbonic acid exhaled. In both cases there is a diminished respiratory combustion.

A CASE OF TOTAL EXTIRPATION OF THE UTERUS AND NEPHRECTOMY AT ONE SITTING, WITH RECOVERY OF THE PATIENT — J. Schmidt reports in the *Münchener Med. Woch.* (1886, No. 40) the case of a woman, 49 years of age, upon whom the operation of extirpation of the uterus for malignant disease was undertaken. It was found that the posterior vaginal wall, the submucous tissue, and the right parametrium were infiltrated. After a tedious operation the uterus was removed, when it was discovered that with it had been taken away a portion of the right ureter about an inch in length. It was decided then to remove the right kidney by lumbar incision. The patient made a good recovery. The author recommends in similar cases, when the ureter has been injured, to proceed at once to extirpation of the kidney, and not to attempt to stitch the ureter in the vaginal wall, since the result would be gangrene or diphtheritic deposit in the vagina, from the constant flow of urine. — *Centralblatt für Medicinischen Wissenschäften*, 1887, No. 31.

PHILADELPHIA
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EDITORIAL.

CHLORAL HYDRATE.

THE death of a lady prominent in society of this city, following the administration of chloral, to which she had been accustomed to resort for the relief of nervousness, has shocked the entire community, and seems to call for a repetition of a warning of the danger of this drug. Unlike other agents of the class of narcotics, its effects seem not to be proportioned to the amount: what might be given at one time with perfect safety becomes on another occasion a lethal dose. This is partially explained by the manner in which it acts upon the nerve-centres. In the first place, it has a sedative influence directly upon the ganglion cells of the cerebral hemispheres and spinal cord, and ultimately upon the medulla; in the second place, it exerts an hypnotic influence indirectly by reducing the blood-supply of the brain, owing to the general dilatation of the arterioles elsewhere throughout the body. In ordinary doses, and as the rule probably, the indirect effect of producing relative anæmia of the brain is the effect which is sought after and obtained; where larger doses are given the direct effect becomes more marked.

It has been repeatedly observed that chloral is a dangerous drug, since patients accustomed to its use may be thrown into a fatal coma by doses smaller than those which they had frequently previously taken with impunity. Even so small a dose as ten grains has caused the death of an adult; while others have recovered without ill effect after swallowing an ounce. It is strange that this peculiarity has escaped the notice of so acute a therapeutist as Ringer, who says that "it has been given for months apparently without any bad results," and has much to say in its favor; but he neglects to mention its great danger when habitually resorted to for insomnia or nervous irritability.

We have observed that in some cases the fatal doses have been taken just after a meal, the coma rapidly supervening and the fatal termination occurring suddenly. Possibly the chemical changes incident to gastro-intestinal digestion may explain the excessive and otherwise unaccountable narcotic effect from the dose which is ordinarily taken with impunity when the stomach is at rest. It has been determined, from experiments made by Amory, that chloral ordinarily does not undergo decomposition in the body, and consequently does not liberate chloroform in the blood, as Liebreich affirmed. It is worth considering, however, whether Liebreich's original hypothesis may not be correct in these exceptional instances. Since, in the presence of alkali, chloral is readily converted into chloroform and formic acid, this may also occur, if not in the blood, at least in the duodenum when chloral, mixing with the food, passes through the pylorus to come at once in contact with the highly alkaline bile. Under such circumstances, given the coexistence of a weak, dilated, or fatty heart, the liberation of an amount of chloroform too small to escape by respiration, or at least too insignificant to make its presence evident to the senses, might rapidly prove fatal. There may be other explanations for these very sad accidents that have occurred from small doses of chloral hydrate, but this one is at least sufficiently plausible to warrant us in warning our patients against taking chloral just after eating a hearty meal, or, indeed, at any other time, unless under the direction of competent medical advice.

The quality of the chloral should also be taken into consideration, and for medicinal purposes only pure recrystallized chloral should be used.

RHUS-POISONING.

THE Board of Health of this city has acted commendably in ordering the removal of poison-ivy from cemetery-grounds on account of the many cases of poisoning which have lately occurred. If a similar rule were made and enforced with regard to all public parks, it would save much annoyance and suffering. There is, it is true, a great difference in the individual susceptibility to the effects of the poison, the resulting dermatitis venenata being in some a trifling affair, in others seriously threatening life. A case was reported to the County Medical Society of this city some time ago in which proctitis and peritonitis resulted from extension of inflammation from the anus, to which a leaf had been applied after defecation while on an excursion in the woods. In some instances direct contagion has been traced, as where a physician, after employing himself in pulling up a few weeds in a cemetery, stopped to see a patient and dressed a fractured forearm on his way home. Both physician and patient subsequently suffered with acute dermatitis, which was supposed to be erysipelas by the latter.

Owing to the different degrees of effect produced, varying from nothing at all up to a very acute and extensive inflammation, an opportunity for exact comparison of the value of remedies is wanting; hence the number of specifics. The first indication seems to be to counteract the poison (toxicodendric acid) by the application of an alkali (sodium carbonate, bicarbonate, borate, or hyposulphite); and the second is to relieve the dermatitis by sedative and anodyne applications. The combination of carbolic acid with oxide of zinc ointment (in the proportion of twenty to thirty minims to the ounce) has answered admirably in checking the spreading inflammation and relieving swelling and pain. It has been suggested by a correspondent of another journal that the alkaline solution of sodium carbonate be applied by dipping a piece of bread in it and placing it over the inflamed area; subsequently, if it become dry, water could be dropped upon it; thus making it in effect a bread-poultice. As it is claimed that it certainly affords relief to the pain, it seems that this is a good suggestion.

A FATAL ACCIDENT DURING ETHER-ANÆSTHESIA.

THE daily papers of this city have recently given an account of a fatal case during the administration of ether. In the midst of an operation for the relief from hemorrhoids of a middle-aged man, under the care of Professor Agnew, the patient suddenly stopped breathing and could not be resuscitated, although it is claimed that the heart continued beating for several minutes after respiration had ceased. The coroner's physician, Dr. Formad, made an autopsy, and discovered evidences of long-standing inflammatory and degenerative disease in the brain and medulla oblongata. The lungs were not engorged, but were collapsed. Death was probably due to the immediate shock of the operation or excessive apprehension; the lesions found were sufficient to cause death under any unusual excitement or emotion, but they do not correspond with the usual effects of ether when taken in a toxic dose.

THE COOPER HOSPITAL, of Camden, was opened formally on the 8th inst. The buildings and grounds, both presented by members of the Cooper family, cost over one hundred and twenty-five thousand dollars. Nearly two hundred thousand dollars is invested in a permanent endowment-fund, and twenty thousand dollars more will soon be added by a bequest, at the expiration of a life-estate, devised by Mrs. Jane V. Chambers, deceased.

LEADING ARTICLE.

ON THE DEGENERATION OF NERVES.

WHEN a section is made in the continuity of a nerve, the peripheral extremity undergoes changes classed under the name of degeneration.

At a recent meeting of the Biological Society of Paris, M. Arloing made a valuable contribution to the study of the degeneration of nerves and the trophic nerve-centre. The nature of this phenomenon has been differently described. M. Arloing considers it sufficient to begin by studying the modifications which take place at the end of the central extremity.

M. Ranvier has demonstrated that this region is the source of the generation and progressive extension of the axis-cylinder, and these exposed cylinder axis-buds are the starting-point of the regeneration of the peripheral extremity. M. Vanlaired has confirmed these statements. M. Ranvier concluded that the development of nerve-fibres in a pathological state begins in the central nerve-cells. This author did not, however, accept as the explanation that the axis-cylinder, killed by section, acts upon the nuclei and protoplasm so as to increase the activity of these, as a fragment of necrotic bone acts upon the neighboring portions. He rather believed that the nerve exercises a moderating influence upon its own nutrition, and that this influence is suppressed, after section, throughout the entire peripheral extremity. M. Arloing considers this to be a gratuitous hypothesis, but believes it probable that the axis-cylinder becomes sphacelated after its separation from the cell from which it proceeds, and produces all the characteristics of necrobiosis. M. Ranvier based his opinion on the fact that the loss of excitability in the peripheral extremity coincides with the segmentation of the axis-cylinder by the nuclei of the protoplasmic sheath. He concludes that the suppression of physiological properties—or, in other words, the mortification of the axis-cylinder—does not precede, but follows, the anatomical alterations. Consequently, this specific necrosis cannot be the cause of the alterations.

This argument appears irrefutable. But it is possible that mortification may begin in the peripheral segment of the cylinder-axis immediately after section, without causing the suppression of excitability or of conductibility.

Functional death gradually takes place in the peripheral extremity immediately after section, as is observed in large animals; organic death progresses simultaneously, and immediately exercises its influence upon the surrounding protoplasm.

This opinion, in conjunction with the important facts discovered by Augustus Waller, led M. Arloing to conclude that the trophic centres described by this author are simply the generating centres of the fundamental portion of the nerve-fibres. Consequently a fibre will present the phenomenon of degeneration when separated from the cell from which it proceeds, or when this cell loses its own properties.

The greater number of modern embryologists concur in the opinion that the rachidian ganglion proceeds from the medullary tube, but they are unable to explain the manner in which the posterior roots develop. Some believe, with Balfour, Hensen, Marshall, Kölliker, Bedot, that these roots proceed from the same substance which supplies the ganglion; others believe, with His, that they are formed by very thin fibres which proceed from the ganglion to the spinal marrow, or from the spinal marrow to the ganglion, according to Sagemehl. The opinion of His is the more probable.

The observations made by Waller upon the results consequent upon section of the posterior roots have proved that the centre of emission of their fibres resides in the rachidian ganglion. Thus, the cells of this ganglion are at the same time the emitting centre (*centre émissif*) of the fibres of the posterior roots, of the peripheral fibres, and of the mixed nerves.

This fact is true in the case of fishes as well as in mammals.

The Deiter nerve-process in the ganglionic cells of a dog is bipolar. The constitution of this process may be explained by bending the opposite poles of the cells of a fish towards each other. When this bundle of axis-cylinder filaments has extended to a certain distance it divides into two: one bundle proceeds towards the spinal marrow, the other towards the periphery. At the point where this division takes place an annular constriction occurs. This phenomenon invariably takes place at

the bifurcation of the pre-terminal nerve-fibres. The connecting fibre which unites the cells of the ganglion with the cells of the medullary tube is almost exclusively formed by the ganglionic cell.

When the spinal marrow is compressed in its continuity, degeneration progresses upward in the posterior cords and downward in the anterior cords. Modern anatomo-pathologists, or rather pathologists, deduce the following law from these facts: The columns of the spinal marrow degenerate according to the direction of the nerve-transmission.

It is more reasonable to ascribe these phenomena to the law of degeneration of radicular fibres, and say that degeneration in the fibres of the posterior cords proceeds upward, because their emitting centres (*centre émissif*) are situated in the spinal ganglia or the medulla, while the fibres of the posterior cords have their emitting centre in the cephalic portion of the cord. The cells which, in some species, are dispersed in the interior of the posterior cornua are simply supplementary cells (*cellules de relais*), placed on the track of the nerve-fibres which unite the periphery with the sensitive centres, or with the centres of ideation of the cerebral cortex. Analogous parts are also found on the track of the motor system. Waller's experiments show that the trophic centre, or emitting centre (*centre émissif*), of the motor roots is enclosed in the cord. The anterior spinal ganglia (if such an expression may be used) remain confounded with the medullary tube, though in some cases they are removed to a certain distance. Such is probably the signification of the ganglion placed on the passage of the hypoglossal nerve (Meyer, Vulpian, Toussaint). Among the cells of the anterior cornua there are some which bear the same relation to the anterior roots as the cells of the spinal ganglion bear to the posterior roots. These cells are produced without and within, and are connected on this side by the anterior roots and by their mediation with the psycho-motor cells, or with the supplementary cells (*cellules de relais*), interposed between these last and the trophic cells. The spinal marrow is not possessed of motor spontaneity. But it possesses reflex power: therefore it must be admitted that the supplementary cells are connected with the posterior roots. These relations remain to be determined.

The most interesting deduction drawn from these considerations is that concerning the precise function exercised by the cells of the anterior cornua. None of these cells are auto-motory. They receive their impulse from the cerebral cells. If this impulse ceases to proceed from the brain on account of the cortex being destroyed, or if it is prevented from reaching the medulla cells by the existence of a solution of continuity in the connective tissues, paralysis will exist simultaneously with sclerosis of the cords of the spinal marrow, while the anterior cornua and roots are intact.

If the suppression of motor impulse lasts longer, the degeneration which occurs in the fibres of the anterior cords reaches the supplementary cells (*cellules de relais*), then the emitting cells (*cellules émissives*), and, finally, the roots themselves. This probably happened in the case of M. Charcot's and M. Brissaud's observations, where muscular atrophy was always preceded by organic alteration of the cells of the anterior cornua.

If paralysis follow a medullary lesion, the alteration of the anterior cornua must necessarily follow. But it is possible that in a medulla lesion one group of the cells of the anterior cornua may be degenerated whilst the other is intact. In other words, a case may occur in which the trophic cells of the anterior roots are alone destroyed; in another case the supplementary cells (*cellules de relais*) may be the only ones deteriorated.

M. Arloing concluded his communication by remarking that all these facts corroborate the law of degeneration established by Waller.

NOTES FROM SPECIAL CORRESPONDENTS.

LONDON.

THE season of medical activity as displayed in societies and medical schools is over for the academic year 1886–7, and already the centre of interest is shifting to Dublin, where we are promised a most successful meeting of the British Medical Association. Dr. Banks, Regius Professor of Physics in the University of Dublin, presides over the meeting, and his presidential address consists chiefly of an historical sketch of the growth of the Irish school of medicine. He shows that in 1618 medicine became an integral part of the teaching of the

then young University, which, like Harvard, had been organized by Cambridge graduates. The candidate for a degree in medicine at that date was required to have studied for seven years after taking the M.A. degree, and at the end was required to engage in a public disputation; he was, moreover, required to afford proof that he had cured four cases of different diseases,—a very unusual and it would seem impracticable regulation, seeing that the degree to be obtained at this examination was his license to practise. The College of Physicians took origin in 1626, when Charles I. addressed a letter to Viscount Falkland "creating" a college after the pattern of the College of Physicians in London. One of the original Fellows of this college was Sir William Petty, an erratic genius, who, after filling simultaneously the apparently incongruous chairs of Anatomy and Music in Oxford, passed over to Dublin, became Physician to the Parliamentary army, then Clerk of the Council and Secretary to Oliver Cromwell, and finally, growing immensely wealthy, founded the family of which the Marquis of Lansdowne (Governor-General of Canada) is now the head. The College of Physicians got its present cumbrous title of the "King's and Queen's College of Physicans of Ireland" in 1699, when a new charter was granted to it by William and Mary. Sir Patrick Dun, who bequeathed money which was used for founding the hospital which bears his name, had been William's physician, and was the first president of the college. Dublin has altogether three hospitals founded by the munificence of physicians, the other two being the Steevens and the Rotundo Lying-In Hospital. Of the eminent men who belonged to the Dublin school of medicine in the earlier part of the present century it is hardly necessary here to speak at length. Dr. Banks mentions especially Dr. Cheyne, Dr. John Crampton, Sir Philip Crampton, Sir Henry Marsh, Dr. Graves, Dr. Stokes, and Sir Dominick Corrigan. The latest addition to Irish universities—the Royal University—is also one of the most vigorous, the total number of persons presenting themselves at the various examinations last year having been two thousand nine hundred and thirty-three. It is, I believe, the only university, besides the London University, in the United Kingdom which gives degrees to women. Last year the degree of B.A. was conferred on nine women, and the degree of M.A. on one, an event said to be unprecedented in university annals.

The address in medicine by Professor Gairdner also is an historical essay. He addresses himself to answer the question, asked in somewhat scornful wise by Sir William Hamilton, "Has the *practice* of medicine (that is, the art as distinguished from the science) made a single step since Hippocrates?" The general result at which Professor Gairdner arrives is that whatever hesitation might have been felt by an impartial observer in 1832, when the great Edinburgh Professor of Logic and Metaphysics propounded his mocking question, none can fairly be felt now. The permanent gains which he believes have been made are (1) the increased power of managing disease afforded by the lessons learned from preventive medicine; (2) the abolition of routine blood-letting; (3) the treatment of fevers *lacte non vino*, to quote the words of the Public Orator when an honorary degree was recently conferred on Professor Gairdner by the University of Dublin; and, finally and inclusively, an increased stability of the medical art, a more secure position in connection with demonstrable or demonstrated facts, so that it would be no longer possible for any man, coming forward with a new theory not based upon the careful study of facts, to make such a revolution in medical practice as John Brown, of Edinburgh, achieved a century ago, and "such as has been over and over again witnessed in the history of medicine almost from the days of Hippocrates."

Dr. Gasquet's address as president of the Section of Psychology is a plea for a more systematic study of the mental and moral as distinguished from the purely bodily phenomena of insanity. In the causation, he thought, greater attention should be given to the influence of the various passions,—jealousy, remorse, anxiety, grief,—which act, indeed, only by and through the nervous system, but in their nature and origin are mental rather than cerebral. While with regard to symptoms he contends that, speaking generally, it might be said that the bodily condition supplies the general direction which the insanity takes, while the details by which each individual seeks to account for his altered feelings are derived from his past mental experiences. He refers as an unsettled point to the question whether all the mental faculties are alike liable to perversion, or whether any laws of thought or processes of mind remain always normal so long as they are manifested at all. In conclusion, he asks whether the psychological side in the treatment of the insane has not been unduly neglected,—neglected, that is to say, not by individual physicians, but as a systematic method, the principles upon which such a system of treatment must rest never having been laid down.

In the Section of Medicine Dr. William Moore's address is very short, and is chiefly concerned with a comparison of the existing knowledge of the pathology of fever—by pathology is not to be understood morbid anatomy, but the "pathonomy" of Dr. Moxon—with that of thirty or forty years ago. He lamented that while in diagnosis and morbid anatomy precision was attainable, in prognosis and treatment we had not advanced beyond the domain of probability.

Sir George Porter in addressing the Section of Surgery is very brief, confining his remarks to a welcome; in the Sub-Section of Laryngology Dr. McNeill Whistler is not much more lengthy, but he suggests the formation of a Laryngological Association, which would afford better opportunities for discussing and sifting theories than laryngologists in this country at present possess.

The report of the Committee appointed by the Local Government Board to inquire into M. Pasteur's treatment of hydrophobia is very favorable to him. The Chairman of the Committee was Sir James Paget, and the other members were Dr. Lauder Brunton, Dr. George Fleming (Principal Veterinary Surgeon of the Army), Sir Joseph Lister, Dr. Richard Quain, Sir Henry Roscoe, M.P., and Professor Burdon Sanderson. Many experiments were conducted for the Committee by the Secretary, Professor Victor Horsley, F.R.S.

The report, first of all, refers to the preventive inoculation of dogs; after summing up the evidence it continues:

"It may, hence, be deemed certain that M. Pasteur has discovered a method of protection from rabies comparable with that which vaccination affords against infection from smallpox. It would be difficult to overestimate the importance of the discovery, whether for its practical utility or for its application in general pathology. It shows a new method of inoculation, or, as M. Pasteur sometimes calls it, of vaccination, the like of which it may become possible to employ for protection of both men and domestic animals against others of the most intense kinds of virus. The duration of the immunity from rabies which is conferred by inoculation is not yet determined, but during the two years that have passed since it was first proved there have been no indications of its being limited."

The contention that his system may be applied to the prevention of the development of hydrophobia in an individual already bitten by a rabid animal is, of course, a very different proposition. To it the Committee especially directed its attention: it is pointed out that the question cannot be answered by a mere numerical comparison of the cases treated and untreated, owing to (1) the impossibility of ascertaining with certainty in all cases whether the animals were really rabid; (2) the varying danger of bites inflicted through clothes or on the naked flesh, of bites treated or untreated by local cauterization, of bites which bleed freely or not; (3) the varying virulence of the animal inflicting the bites, the bites of rabid wolves and (probably) of rabid cats being more dangerous than those of rabid dogs. Certain members of the Commission who went to Paris carefully investigated a series of ninety cases taken consecutively from those appearing earliest in M. Pasteur's register. They visited these patients in their homes and collected evidence on the spot: the result was that of the ninety cases twenty-four were bitten on naked parts by undoubtedly rabid dogs, and the wounds were not cauterized nor treated in any way likely to have prevented the action of the virus; in thirty-five cases the dogs were rabid, but the bites were inflicted through clothes; and in thirty-one there was no clear evidence that the dog was rabid. None of the ninety persons died of the disease, whereas the Commission estimate that eight would have died if untreated by M. Pasteur. He, however, has inoculated many persons with regard to whom there was no evidence that they had been bitten by rabid animals, but who feared that they had: consequently in calculating the general result of his method it is necessary to take a very low percentage of mortality. The lowest rate ever assigned is, according to the report, five per cent. of the persons bitten. Between October, 1885, and December, 1886, M. Pasteur inoculated two thousand six hundred and eighty-two persons: of this number thirty-three (or, according to the anti-Pasteurians, forty) died of hydrophobia: five per cent. would have given one hundred and thirty. In two hundred and thirty-three cases it was proved, either by inoculation from their spinal cords or by the occurrence of rabies in other animals bitten, that the biter was rabid; only four of these persons died; the Commission estimate that without M. Pasteur's treatment forty would have died. The conclusion on this head is given in the following terms:

"From the evidence of all these facts, we think it certain that the inoculations practised by M. Pasteur on persons bitten by rabid animals have prevented the occurrence of hydrophobia in a large proportion of those who, if they had not been so inoculated, would have died of that disease. And we believe that the value of his discovery will be found much greater than can be estimated by its present utility, for it shows that it may become possible to avert by inoculation, even after infection, other diseases besides hydrophobia. Some have, indeed, thought it possible to avert smallpox by vaccinating those very recently exposed to its infection; but the evidence of this is, at the best, inconclusive; and M. Pasteur's may justly be deemed the first proved method of overtaking and suppressing by inoculation a process of specific infection. His researches have also added very largely to the knowledge of the pathology of hydrophobia, and have supplied what is of the highest practical value,—namely, a sure means of determining whether an animal which has died under suspicion of rabies were really affected with that disease or not."

The report next passes to the question

whether the treatment is itself free from danger. It will be remembered that M. Pasteur has made use of three different methods: the ordinary method employed at first, and still used in all cases but those considered especially dangerous; the "intensive method" (*méthode intensive*), first introduced when the patients bitten by wolves died in such large proportion; and the modified intensive method, used in dangerous cases since the fear has arisen that the intensive method may itself be dangerous. The three methods are shown in the following tables taken from the report:

TABLE I.—*Early or Ordinary Method.*

Days of Inoculation.	1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th.	9th.	10th.
Days during which the spinal cord had been dried...	14	13	12	11	10	9	8	7	6	5

TABLE II.—*Intensive Method.*

Days of Inoculation.	1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th	9th.	10th.	11th.
Days' drying of the cords.....	14, 13, 12	11, 10, 9	8, 7	6, 5	4, 3	2	1	6, 5	4, 3	2	1

TABLE III.—*Modified Intensive Method.*

Days of Inoculation.	1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.	13th.	14th.	15th.
Days' drying of the cords...	14, 13	12, 11	11, 10	10, 10	9, 9	9	8	8	8	7	7	7	6	6	5

The Committee state that "by the first or ordinary method there is no evidence or probability that any one has been in danger of dying, or has in any degree suffered in health even for any short time. But after the intensive method, deaths have occurred under conditions which have suggested that they were due to the inoculations rather than to the infection from the rabid animal."

The symptoms bore a striking resemblance to those of paralytic rabies (the form usually seen in rabbits and occasionally in dogs), and in one case, that of Goffi, an attendant at the Bronn Institution, bitten by a rabid cat, it was shown by inoculations made with his spinal cord that his death was due to rabies: whether the rabies of the cat or the rabies of the intensive inoculations cannot be proved, though Mr. Horsley thinks, from a comparison of the dates, that it could not be the latter. Goffi was bitten on September 4, M. Pasteur's treatment was commenced on September 5; he was taken ill on October 18, and died on October 20. The symptoms were those of acute ascending paralysis (Landry's paralysis), and it is suggested that some at least of the cases described under this name may have been cases of the paralytic form of hydrophobia, which is stated (though no authority is given) to have been observed in men bitten by rabid animals and not inoculated. Whether the intensive method was responsible for some of the deaths is left undecided, as it was thought unnecessary to pursue further a very complicated question which has ceased to have any practical interest owing to M. Pasteur having now adopted a modified course. The general conclusion of the Committee is that hydrophobia and rabies might be stamped out by the rigid enforcement of adequate police regulations with regard to dogs. The average annual number of deaths from hydrophobia in England for the decade ending 1885 is forty-three: if this be taken to represent five per cent. of the persons bitten, it would seem that M. Pasteur's treatment would be required by eight hundred and sixty persons every year in England alone.

An interesting discussion of ophthalmoplegia was raised by a paper read by Mr. Jonathan Hutchinson, Jr., at the Ophthalmological Society. The most important point brought out was that there were two, if not three, different classes of cases of ophthalmoplegia externa, and that the prognosis probably differed in each. The diagnosis therefore becomes of practical importance. There is a type of the disease in which it is symmetrical from the first, gradually progressing to complete paralysis of all the muscles; this is very intractable, and is probably due to cerebral lesion. In another type the disease was not symmetrical, came on quickly, and generally got well. The paper read by Mr. Hutchinson, Jr., was an example of the second class; the right eye only was affected; the patient died of cellulitis occurring around a syphilitic ulcer of the leg. The ophthalmoplegia was found to be due to neuritis sec-

ondary to chronic inflammation about the right cavernous sinus, which had also produced obliteration of the sinus, partial obstruction of the carotid artery, and adhesion of the apex of the temporo-sphenoidal lobe to the dura mater. In two other very similar cases of ophthalmoplegia interna and externa recovery took place under iodide of potassium, and there was very strong reason for believing that in all the cases the inflammation was of syphilitic origin. It was pointed out that the occurrence of protrusion of the affected eye and congestion of the lids present in these cases was due to the involvement of the cavernous sinus, and might be of great use in making a diagnosis. Dr. Necles, during the discussion, mentioned a case which must be very rare: double ophthalmoplegia externa and interna (coming on gradually, first affecting one eye and then the other) due to tubercular meningitis.

At a previous meeting an excellent discussion took place on toxic amblyopia. The general opinion was in accord with that expressed by Mr. Nettleship in opening the discussion: namely, that tobacco is a more powerful agent than alcohol, and is capable of producing amblyopia which is characterized by a central scotoma without the aid of alcohol in any form. Since the amblyopia comes on in many cases at a time when no alteration in the quantity or quality of the tobacco used is made, there must be some other determining element, and this is to be looked for either in a mental shock or perhaps in failing vitality due to increasing age. Tobacco-amblyopia is seldom seen before forty years of age, and is certainly more common in persons who smoke strong tobacco and drink much alcohol. If the sufferer will give up tobacco the vision rapidly improves and the prognosis is on the whole good, though relapses may occur if the habit of smoking is resumed. Some ophthalmologists prescribe strychnine, and others iodide of potassium; but it is at least doubtful whether either drug has anything to do with the recovery.

Mr. Cross, of Bristol, related to this Society two cases in which he had eviscerated the eye and introduced an artificial vitreous into the sclerotic in the manner recommended by Dr. Mules, of Manchester. In both cases the operation was done for penetrating wound, in both the wound was found after some days to have gaped, and in both the remaining eye became affected with sympathetic ophthalmitis seventeen and twenty-one days respectively after evisceration. The cases were considered to be analogous to cases of sympathetic ophthalmitis occurring after and in spite of enucleation, but not caused by the operation. The danger of such a fistulous track as was caused by the gaping of the sclerotic junction over the globe was, however, pointed out. Mr. Cross thought that such a septic fistula might result either from imperfect healing or from wearing away of the conjunctiva between the artificial vitreous and the artificial eye. Dr. Miles said that these two cases were the first recorded instances after his operation. The general opinion was that Mr. Cross had rightly described both his cases as examples of sympathetic ophthalmitis; and in this connection the existence of a fistula leading from the conjunctival sac to the sclerotic cavity is worthy of note, though Mr. Cross was inclined to attach far more importance to a probable tendency to sympathetic ophthalmitis existent before the operation.

The accounts of the improvement which has taken place in the Crown-Prince of Germany are most glowing. Dr. Morell Mackenzie has got away the whole of the growth, leaving, however, a broad base, and the prince's voice has greatly improved.

Mr. W. S. Savory, F.R.S., Senior Surgeon to St. Bartholomew's Hospital, has been re-elected President of the Royal College of Surgeons of England, and now enters upon his third term of the office. This is a departure from the usual custom, which has been to choose a new President every year. It is probably, in part at least, dictated by a desire to leave the negotiations in progress for obtaining a new charter and the right to grant degrees in medicine in the same hands. The proposed charter creating a "Senate of Physicians and Surgeons" has been published. The Senate would consist of the President and twenty-three members of the Council of the College of Surgeons, and the President and twenty-three Fellows (elected by the Comitia) of the College of Physicians. The general principle of the scheme appears to be universally approved. The omission of the teachers as such can be defended on the ground that the Senate, constituted as above stated, would probably consist entirely of men who were engaged in teaching or were in the position of Emeritus Professors. Whether the graduates of a university ought or ought not to have some recognized share in the constitution of the governing body has always been a matter of dispute from the earliest days of universities. It is the custom in England to admit this right; but this custom has been the source of many conflicts at Oxford and Cambridge, even in recent years. Its omission, however, from the present scheme is not a popular move, using that phrase in the political sense.

Mention was made in an earlier letter of the new regulations for the Croonian lectures at the Royal College of Physicians. The augmented income of the Trust Fund permits the College to give the Lecturer one hundred pounds as his honorarium, and a similar sum will be placed at his disposal to defray the cost of experiments and generally for making preparations for his lectures. Dr. Donald Macalister, who is a Fellow of St. John's Col-

lege, Cambridge, and is Secretary to the Medical Board in Cambridge, will be the first lecturer under the new regulations. His lectures, given early this year at the College of Physicians, on "Fever," were highly appreciated, and there is every reason to hope that he will be able to establish a good precedent. Dr. W. H. Dickinson will be the Lumleian Lecturer. He has chosen for his subject "The Tongue considered with Reference to Constitutional and Organic Diseases,"—*i.e.*, considered symptomatically.

The two Colleges of Physicians and Surgeons in London are the owners of some spare ground adjoining the new Examination Hall on the Thames Embankment. It has been determined by formal resolution to make use of this site for the erection of a building for "the investigation and exposition of such branches of science connected with medicine and surgery as the two colleges may from time to time determine." This is understood to mean a lecture-theatre and laboratories.

We are at present suffering from drought. There has been no general rain for three months, and the few showers which have fallen here and there have not made any appreciable difference; streams and ponds which are usually full throughout the year are dried up, and the stock of water for drinking in many localities is seriously diminished. In Swansea indeed there is a "water-famine," and Manchester is threatened with a like misfortune. So prolonged a drought is very uncommon in this rainy isle, and town and country districts are alike as unprepared for it as is London for a heavy snow-storm in winter.

DAWSON WILLIAMS.

PROCEEDINGS OF SOCIETIES.

AMERICAN CLIMATOLOGICAL ASSOCIATION.

(Continued from page 741.)

THE next paper read was by Dr. B. F. Westbrook, of Brooklyn, on

THE LOCAL TREATMENT OF DISEASES OF THE RESPIRATORY ORGANS.

The methods of treatment which had been employed were the direct introduction of coarse sprays, the use of the Evans inhaler, and the use of the pneumatic cabinet. In cases of chronic bronchitis where the cough was severe, a spray of a solution of carbolic acid, fluid extract of hyoscyamus, or other sedative remedies, was employed. Where there is copious secretion, astringents are called for, and of these tannic acid, iron salts, and fluid extract of pinus canadensis had been employed. The pneumatic cabinet had been used with marked success in the treatment of chronic bronchitis. The patient is confined in the cabinet under a diminished pressure, the sitting lasting from ten to fifteen minutes. This may be combined with the inhalation of the spray. If there is much emphysema the cabinet is not indicated. In using the cabinet in the treatment of chronic interstitial pneumonia and bronchiectasis there is danger, if the pressure is great, of producing emphysema of those portions of the lung still accessible to the air. The pressure should not exceed one-half an inch of mercury.

In the treatment of phthisis the best results are obtained in the early stages of the disease, or where the disease, although further advanced, is limited to a small portion of the lung. The use of sprays is beneficial only in so far as we desire to treat the coexistent bronchitis or cavities connected with bronchi of the second or third order. In incipient phthisis with very little bronchial catarrh, local treatment is probably of little service. These cases are best treated with compressed air. In a large proportion of the cases we may hope to render the disease latent. The expansion of the lung favors the expectoration of the contents of the smaller tubes and modifies the intra-thoracic circulation. The sittings should be frequent: every day, or every second day. Ten minutes is usually sufficiently long for the patient to remain in the cabinet. The pressure should gradually be increased up to one-half or three-fourths of an inch. If used cautiously, this is the best method for the local treatment of incipient phthisis. With the Evans inhaler his results had also been satisfactory.

In the treatment of advanced cases of phthisis the first effort must be to cure or diminish the bronchitis. The pneumatic treatment then comes into play. This gives better expansion, improves the circulation, and alters the action of the trophic nerves. In all cases internal medication has been combined with the local treatment. The more acute the disease the higher the fever, and the more sudden the onset the less can we expect to accomplish by treatment. In no single case diagnosticated as acute phthisis did treatment have the slightest effect.

Dr. A. Y. P. Garnett, of Washington, D.C., read the first paper of the second morning session, entitled "Observations upon the Sanitary Advantages of Tidewater Virginia, including Virginia Beach, as a Winter Health-Resort."

The next paper was by A. L. Loomis, M.D., of New York City, on

EVERGREEN FOREST AS A THERAPEUTIC AGENT IN PULMONARY PHTHISIS.

It has long been known that similar climates, as determined by geographical and meteorological conditions, have different therapeutic effects. That there is some rela-

tion between the development of organisms and atmospheric conditions is becoming more and more apparent. We know that cold and high altitudes render the air aseptic, but the degree of cold and the height required are so great that clinically it is not possible to derive much advantage from this fact. The effect of a purely aseptic air upon ulcerative processes is not so great as the effect of an atmosphere which is aseptic on account of the presence of antiseptic agents. The belief in the good effect of pine forests in cases of phthisis is quite unanimous, and the author thought that the clinical evidence in favor of their beneficial influence in these cases was also unquestioned. The atmosphere in such regions is not only aseptic, but also antiseptic. Such an atmosphere contains considerable turpentine vapor, and we should therefore expect it to contain a certain amount of peroxide of hydrogen. In the speaker's opinion, the majority of cases of phthisis die not directly from the lesions in the lung, but from the secondary septicæmia and pyæmia which is set up. It is impossible to apply to the ulcerations within the lung the antiseptic washing and dressing that is employed in external lesions; but if an antiseptic atmosphere can be obtained we may hope to counteract the secondary poisoning. Such an atmosphere will not destroy the bacilli, but it will accomplish much in the way of arresting the suppurative process. It was the opinion of the speaker that the atmosphere in the region of evergreen forests acts in a manner similar to the antiseptic agents which are successfully used to arrest suppurative processes in other portions of the body. He thought that in all probability the active agent was the peroxide of hydrogen resulting from the oxidation of the turpentine-vapor. While it is not possible for every one suffering with pulmonary phthisis to obtain an antiseptic atmosphere, yet it is possible to render the air of any particular locality antiseptic. The evergreen forests should be preserved, and evergreen trees should be planted in the neighborhood of our homes.

A paper entitled "The Climate of the Sub-Peninsula, Pinellas, Florida," was read by Dr. W. C. Van Bibber, of Baltimore.

ENVIRONMENT IN ITS RELATION TO THE PROGRESS OF BACTERIAL INVASION OF TUBERCULOSIS

was the subject of a communication read by Dr. E. L. Trudeau, of Saranac Lake.

Environment evidently has an important bearing in reference to bacterial invasion. The author proposed to himself the following questions: 1. What results ensue when bacillar invasion and unhygienic conditions are made to coexist? 2. Are unhygienic surroundings sufficient to cause phthisis when precautions are taken to exclude the bacillus? 3. Is bacterial infection always productive of tuberculosis when the animal is placed under the most favorable hygienic conditions? In order to answer these questions the following experiments were performed. Fifteen healthy rabbits were taken and divided into three sets of five each. The first experiment consisted in taking five of the rabbits, inoculating each with a pure culture of the tubercle-bacillus, and subjecting them to overcrowding in a dark cellar, with poor and insufficient food and other unhygienic conditions. In the second experiment five rabbits were placed in a box and lowered into a pit dug in the ground, the mouth of the pit covered with earth with the exception of a trap-door for the introduction of food, which consisted of one small potato for each animal per day. So damp was the air that the box in which the animals were confined was constantly wet. The third set of animals were inoculated with the tubercle-bacillus and turned loose on a small island, where they had abundant sunlight, fresh air, and exercise. They were daily supplied with wholesome food.

The results of these experiments were that four of the first five rabbits died in three months, and extensive tuberculosis was found. The fifth animal was killed at the end of five months, and the same condition found. The second set of five rabbits were all living at the end of four months. They seemed to be as active as at the time the experiment began. They were then killed, and careful examination revealed nothing abnormal. One of the third series of rabbits died at the end of one month, and on examination there was enlargement of the cervical and bronchial glands, and tubercles in the spleen. The remaining rabbits continued in apparently good health, and were killed at the end of four months. They were loaded with adipose tissue, the flesh was firm and red, all the organs were normal, and even the seat of the punctures could not be made out. These experiments confirm the view that the production of tuberculosis is a most complex process. Although the environment may bear but the relation of a predisposing cause to the microbe invasion, it is nevertheless a most potent factor in determining the future and the final results of the disease, and, while we may not underestimate the pathogenic properties of the bacillus, the effect of environment upon the vitality is a factor which must not be ignored.

At the afternoon session the first paper was read by Dr. Walter Platt, of Baltimore, "On the Climate of St. Moritz, Upper Engadine, Switzerland."

Dr. A. C. Peale, of the United States Geological Survey, Washington, presented "A Classification of American Mineral Waters."

"St. Augustine as a Winter Health-Resort" was the title of a paper by Dr. F. F. Smith, of St. Augustine.

He described the geographical and climatic conditions existing in St. Augustine. An abundance of pure water is obtained from sixty artesian wells; this water is charged with sulphuretted hydrogen. Drinking-water is obtained by means of cisterns. A complete system of sewers is now being introduced; these will be flushed by the waste water from the artesian wells. The average temperature during the winter months of the past ten years has been as follows: November, 63°; December, 57°; January, 55°; February, 58°; March, 61°; April, 67°. The average number of rainy days during the winter months for the past ten years has been thirty-three, but on nineteen of these occasions the rainfall was at night, so that there were really only fourteen rainy days.

The following papers were read by title:

"An Invalid's Day in Colorado Springs," by Dr. S. E. Solly, Colorado Springs.

"The Climate of Southern California," by Dr. H. S. Orme, Los Angeles, California.

"Pass Christian, Mississippi, as a Health-Resort," by Dr. Charles Le Roux, Pass Christian.

The report of the Committee on the Congress of American Physicians and Surgeons was received and adopted. Dr. A. L. Loomis, of New York (with Dr. F. Donaldson, Sr., of Baltimore, as alternate), was appointed as the representative of the Association to the Committee on the Congress.

The following were elected to membership:

Drs. A. L. Gihon, U.S.N.; W. P. McDougal, San José; A. C. Peale, U.S. Geological Survey; E. Wilds Linn, Los Angeles; F. F. Smith, St. Augustine; F. P. Henry, J. J. Levick, and Thomas J. Mays, Philadelphia; Thomas C. Leatmer, J. Carey Thomas, and Walter Platt, of Baltimore; S. E. Solly, Colorado; S. W. Langmaid, Boston; S. E. Morgan, Washington; S. H. Chapman, New Haven; and S. A. Fisk, Denver.

Officers for the ensuing year—

President.—Dr. A. L. Loomis, New York.

Vice-Presidents.—Drs. A. Y. P. Garnett, Washington, and James T. Whittaker, Cincinnati.

Secretary and Treasurer.—Dr. James B. Walker, Philadelphia.

Council.—Drs. E. T. Bruen, Philadelphia; J. H. Tyndale, New York; F. H. Bosworth, New York; F. H. Shattuck, Boston; and R. G. Curtin, Philadelphia.

The Association then adjourned.

THE ASSOCIATION OF AMERICAN PHYSICIANS.

(Continued from page 744.)

DISCUSSION ON ANTIYRETICS.

DR. I. E. ATKINSON, of Baltimore: So far as the temperature-reducing power of these agents is concerned there can be no question, but, as has been said, we are coming more and more to realize that elevation of temperature is far from being all there is in pyrexia. As regards the relative merits of thalline, antipyrine, and antifebrine, I think that the tendency to chilling after the use of thalline is decidedly greater than after the use of antipyrine, while the latter is more apt to produce nausea and vomiting. I am disposed to disagree with the statement that the use of these drugs can take the place of the external application of cold water. My experience with the latter measure has been limited. It has recently been reported that one observer abroad has treated two hundred cases in private practice by the use of baths with a mortality of nothing; in army hospitals he has had a mortality of five per cent., and in ordinary hospital practice a mortality of less than eight per cent. Although with antipyretics we can reduce the temperature at pleasure, yet the duration of the case is not lessened, and in some cases it has been thought to have been prolonged.

Dr. H. C. Wood, of Philadelphia: We must not look upon the use of cold water as acting merely by the abstraction of heat. I am convinced that the action is more than this. It probably exerts some reflex influence through the superficial nerves.

Dr. George L. Peabody, of New York: A certain proportion of cases which do not bear the cold bath will bear the use of antipyretic drugs, while, on the other hand, the bath may be used in a certain number of cases in which antipyretics cannot be applied. From clinical experience he was convinced of the truth of the statement of Dr. Wood, that the cold bath accomplishes more than the simple reduction of temperature. Its soothing effect upon the nervous system is greater than that accomplished by the reduction of temperature by antipyretic drugs. In many instances the course of the disease is favorably modified by the use of the cold bath.

Another important matter is that since the introduction of these methods of treating fever by antipyretics the number of relapses seem to be greater and more fatal.

He understood the lecturer to say that antipyrine acted solely by diminishing heat-production, and that it did not increase heat-dissipation. He must differ from him on that point. It seems that the increase of heat-irradiation from the surface is very great, not only where it produces sweating, but also where it does not.

Dr. W. W. Welch, of Baltimore, said that he should like much to hear a discussion of the question, How far is the rise in temperature an important element in fever, and an element which calls for interference on the part of the physician? There is comparatively little evidence that the grave symptoms of fever are due simply to the elevation of temperature. There is no doubt that temper-

atures of 110° to 113° produce serious symptoms, but whether or not ordinary temperatures of 105° to 107° exert any serious action on the body is a question which is certainly unsettled. It has been shown that rabbits can be kept in a box with a continuous rectal temperature of 107° for at least two weeks, provided the precaution is taken to keep the box well ventilated and the animals supplied with moist food. Patients may have a perfectly clear brain, and no grave symptoms, with a temperature of 106° or 107°. On the other hand, there are severe and fatal cases of typhoid fever in which the temperature has never registered a great height. While in most cases there is a certain proportion between the height of the temperature and the severity of the disease, yet there are certain cases where this proportion does not exist.

Dr. William Pepper, of Philadelphia: From his experience he had been disposed to think that antipyrine and antifebrine in their antipyretic effect were superior to thalline; as between the two former he had not noticed any marked difference. He had used both largely in a variety of cases, and had not seen any of the dangerous symptoms which have been mentioned by some writers. The action of these drugs seems to be purely through the nervous system, with no effect upon the circulation, the respiration, or upon the secretions save that of the skin. Some of his observations bore upon the question of the relative value of the external use of cold water and the internal use of antipyretics. In the sudden acute pneumonias of children with a temperature of 106° or 107°, with initial convulsions, where the prompt and repeated use of cold baths has been without result, full doses of either of these antipyretics have produced a remarkably successful effect. In a recent case in a child with double croupous pneumonia, involving two-thirds of the left lung and one-third of the right lung, with a temperature in the rectum of 107° and with repeated convulsions, cold baths failed to relieve the symptoms, although repeated at intervals of three hours. Antipyrine in repeated doses controlled the pyrexia at the beginning and on several occasions during the course of the disease, and after a severe struggle the child recovered. As to the ability of these agents to replace cold baths under all circumstances, the evidence is not adequate. In the sudden hyperpyrexia occurring in the course of rheumatism, he was not prepared to accept the view that these drugs are capable of replacing the cold bath. In these cases we have direct evidence that the high temperature is the direct cause of the symptoms, at least of the severe nervous symptoms. He was not one of those who consider high temperature in itself a dangerous symptom. There is no proof that high temperature—provided that it has not induced secondary changes—should be regarded other than as one symptom of the disease. Many of his patients with typhoid fever, with a temperature of from 103° to 105°, have done perfectly well without any measures directed to the reduction of the fever. We, however, meet with cases in which these temperatures are attended with certain symptoms for which there is apparently no other cause. In such cases we must consider that the hyperpyrexia calls for treatment. He had noticed the effect to which attention has been called,—that is, the deep and tranquil sleep which follows the administration of these antipyretics.

Dr. George B. Shattuck, of Boston, had used both antipyrine and antifebrine largely, and it seemed to him that antifebrine offers all the advantages of antipyrine without its disadvantages. It has none of the disadvantages which belong to thalline. Three or four grains of antifebrine accomplish the same results as are produced by a larger dose of the other drugs. The disagreeable symptoms which some writers have referred to as following antipyrine are probably due to the fact that they follow the original recommendation and give two grammes of the drug. The same benefit may often be obtained from one gramme, and often from half this quantity. With reference to the point whether pyrexia is or is not a dangerous feature of the disease, we find clinically that where a patient has high fever and he is irritable, impatient, and uncomfortable, the administration of one of these antipyretics, or the external use of cold water, produces a tranquil and refreshing sleep, and he awakes in a condition much better fitted to continue the struggle with the disease.

Dr. J. C. Wilson, of Philadelphia, agreed with other speakers that antifebrine has many advantages over thalline, particularly in its cheapness and in the smallness of the dose. A recent observation which he had made is interesting as bearing on the question of heat-dissipation. In a case of typhoid fever under his care, antifebrine in five-grain doses was given, repeated whenever the temperature reached 104°. This caused copious sweating, with the usual reduction of temperature, amounting to three and a half or four degrees. On the last occasion one-ninety-sixth of a grain of sulphate of atropia was given with the antifebrine. No sweating occurred, and the temperature was reduced only one and one-half degrees.

Dr. James T. Whittaker, of Cincinnati, differed from those who accept the view that fever is a neurosis. There is no proof that the nerve-centres are distinctly irritated, that the agents which reduce fever act directly on the nervous centres. Is it not more probable that the antipyretic action is really an antimycotic action? We have some observations which go to show that the disease is caused by bacteria, or, if not directly by bacteria, by some of their products, the ptomaines.

Would it not be more rational to study the habits of these bacteria and address ourselves rather to the removal of the cause than to the counteracting of the effects?

Dr. H. M. Lyman, of Chicago: With regard to antifebrine and antipyrine my experience has been that of previous speakers, and my preference for the former drug is growing. Their great value proceeds not so much from their power to reduce temperature as from their general effect, especially upon the nervous system. I regard them as valuable adjuvants in the treatment of disease, largely from their hypnotic and tranquillizing effect upon the nervous system, to which allusion has already been made. In many instances, where in abrupt febrile affections relief has not been secured from antifebrine and antipyrine, this failure is frequently due to the presence of the rheumatic complication, and there salicylic acid will give the relief that we fail to get with the antipyretics.

Dr. John Guitéras: In some experience with these drugs in the treatment of the continued fevers of warm climates, the results had been rather negative, and had shown the advantage of stopping their use after they have been continued for a certain length of time. He had been called in consultation to cases where the drug had been continued for ten or fifteen days, each time that it was given producing a certain reduction of the temperature, but having no permanent benefit, and the patients have begun to improve as soon as the drug was stopped. It has seemed that when given continuously in this way they have an effect on the vaso-motor system. The pulse is weak and dicrotic, and he had considered it advisable to give digitalis. The effect of cold-water baths in these continued fevers of the South has seemed to him more beneficial. If continued for two or three days they often favorably modify the course of the disease.

Dr. George L. Peabody, of New York: With reference to the point suggested by Dr. Whittaker, there is no question in my mind that a considerable proportion of cases of typhoid fever can be aborted by antiseptic treatment of the intestinal ulcers with naphthaline or resorcine. For the past two years I have treated all cases coming under observation during the first ten days of the disease with a calomel purge (ten grains), followed by naphthaline in such doses that at least seventy or eighty grains were taken during the twenty-four hours. Under this treatment he had without doubt succeeded in aborting many cases in which the symptoms were quite pronounced. He had not succeeded in thus cutting short cases coming under observation at the end of the second week.

Dr. H. C. Wood, of Philadelphia, in regard to the dissipation of heat by sweating in his experiments, stated that in the dog there are but few sweat-glands, so that there could be no heat-dissipation from this cause. Sweating in man does undoubtedly cause a dissipation of heat. With reference to the possible influence of antipyrine on fever through some action on the bacteria causing the fever, he said that in the experiments to which he had referred no microbes were concerned in the production of the fever, which was induced by the pyrogenic principle of pepsin.

Dr. James Tyson, of Philadelphia: In a recent case of rheumatism the temperature suddenly went up to 105°, with alarming brain-symptoms. Antifebrine in five-grain doses failed to produce any effect. The patient was then put into a cold bath, and the temperature of the water gradually reduced to 72°. The discomfort experienced by the patient then prompted his removal from the bath. The thermometer in the rectum showed a reduction of only one-half of a degree, but within the course of half an hour the temperature fell three degrees. This was not considered as due to a natural defervescence, but must be attributed to the effect of the bath. The fall in temperature was followed by a disappearance of all the symptoms and the recovery of the patient. While he had never seen any serious results from the use of thalline and antipyrine, yet there have been symptoms which caused much alarm to the attendants. He had not seen such symptoms following the use of antifebrine.

Dr. R. Palmer Howard, of Montreal, wished to emphasize the fact that internal antipyretics and the cold bath are not equivalents; they are substitutes, and important auxiliaries to the physician. These measures relieve special symptoms, but whether or not they shorten the duration of the disease is a question not yet settled.

Another important point is with reference to relapse in typhoid fever. This is a subject which requires investigation. Every relapse, so called, is probably due to the absorption of fresh poison, and is really a fresh attack. It is really an initial attack. It runs a severe course, and often proves fatal.

(To be continued.)

NEW YORK PATHOLOGICAL SOCIETY.

STATED meeting, June 22, 1887, the Vice-President, W. P. NORTHRUP, M.D., in the chair.

GENERAL PERITONITIS.

Dr. MIDDLETON GOLDSMITH sent the specimens, which were presented by Dr. John C. Peters. Dr. King, of his place, was taken ill June 4, and sent for Dr. Caverly, who found him suffering with great pain in the right iliac region, without swelling or tympanites. The abdomen felt natural. Just before Dr.

Caverly's arrival the patient had taken an enema, without pain, but the first effort to pass anything from the bowels was attended by severe pain, and the second attempt by excruciating pain. Dr. Caverly found him with cold extremities, and the face had the ashen hue of death. Two-thirds of a grain of morphine were administered hypodermically, and hot-water bags were applied to the extremities. Dr. Goldsmith was then sent for, who, when he arrived, found the patient without pain; but he said he had been ailing with indefinite pain in the bowels and a good deal of pain in the right iliac region for three weeks; now there was nothing besides except general soreness over the abdomen. The first thought was that there had been some injury, perhaps rupture of the gut in the right groin. The patient died on the fourth day, and at the autopsy almost universal adhesions were found in the right side of the abdominal cavity; there was only about half a teacupful of serum in the cavity; the intestines had adhered to the liver and to other organs with which they came in contact. The gut was filled with water, and was felt to give way slightly under the grasp of the hand, as though there was a small vent; but the entire length of the intestine was examined, and no evidence of injury or an opening was found. All the other organs in the abdominal cavity were apparently in a healthy condition. There was no evidence of injury produced by the nozzle of the syringe with which the patient had injected the enema. Death had taken place from general peritonitis.

TRAUMATIC PERITONITIS—PNEUMONIA.

Dr. H. J. BOLDT presented the lungs and heart removed from the body of a boy, aged 8 years, who on the 12th of June had received a violent blow upon the abdomen with the fist of another boy. He went home and to bed, and shortly afterwards began to suffer intense pain. He had considerable fever during the night, and complained more or less of pain. On the next day Dr. Boldt saw him, when he had a high temperature, extreme tenderness over the abdomen, especially marked in the ileo-cæcal region. Dr. Boldt diagnosticated traumatic peritonitis. In the course of two days, however, evidence of pneumonia developed, which progressed and involved the entire right lung, and subsequently the left lung to a slight extent. The consulting physician suggested aspiration of the right pleural cavity because he thought it contained fluid, but only twenty grammes of fluid were obtained. During the progress of the pneumonia the peritonitis was lost sight of. The patient died on the morning of the 22d of June, and the autopsy was made shortly before the specimens were presented. There was diffuse peritonitis, consolidation of the entire right lung, and some consolidation of the left lung. There was also extensive pericarditis.

PRIMARY EPITHELIOMA OF THE CONJUNCTIVA.

Dr. W. P. NORTHRUP presented a specimen of primary epithelioma of the conjunctiva, occurring in a private patient 3 years and 2 months of age. The boy was first presented to him suffering apparently with a phlyctenula situated on the nasal margin of the cornea of the left eye. The case not progressing favorably, he asked Dr. Agnew to see it in consultation, who corroborated the diagnosis, and also expressed the opinion that it would probably prove to be one of those cases of phlyctenula in which there was delay in the process of repair, and which might leave a trifling amount of thickening of the cornea and conjunctiva. At the end of the second week, there having been no progress towards recovery, Dr. Northrup diagnosticated epithelioma, and again asked Dr. Agnew to see the patient in consultation. At that time there was a nodule about the size of a pin-head, rounded, mobile, the surface furrowed, showing some loss of substance, and towards which three or four blood-vessels were running. The diagnosis was confirmed, and Dr. Agnew recommended that the growth be removed immediately, which was done. The patient promptly recovered from the operation. Microscopical examination of the growth, made by Dr. Northrup, and also by Dr. Delafield, showed it to be an epithelioma.

Dr. Northrup remarked that epithelioma of the conjunctiva was nearly always secondary to disease of the lids. The primary affection of the conjunctiva was exceedingly rare. The prognosis usually was unfavorable, but in this case there had been no evidence of return of the disease seven months after the operation, and Dr. Northrup believed the patient was permanently cured.

BRITISH MEDICAL ASSOCIATION.

FIFTY-FIFTH ANNUAL MEETING, AT DUBLIN, AUGUST 2–5, 1887.

THE first general meeting convened at 11.30 A.M., with an unusually good attendance for the opening meeting. Dr. W. Withers Moore, of Brighton, the retiring President, made his leave-taking in a brief speech.

Dr. John T. Banks, Regius Professor of Physic in the University of Dublin, the President-elect, was conducted to the chair, and responded in an appropriate manner.

A resolution of thanks was proposed and passed to the retiring President.

Sir B. Walter Foster, President of the Council, then made the report for that body. The financial condition of the Association was reported to be in a highly satisfactory condition. The total revenue during the last

year was £25,385 2*s.* 10*d.*, whilst the expenditure was £24,395 15*s.* 6*d.*, leaving a surplus balance of £989 7*s.* 4*d.* The invested capital of the Association amounts at present to £17,566. The membership of the Association has reached about 12,000, and there are now 400 applications for membership.

Edward Hamilton, M.D., F.R.C.S.I., Professor of Surgery in the Royal College of Surgeons of Ireland, Surgeon to Steevens Hospital, Dublin, delivered the

ADDRESS IN SURGERY.

The speaker first paid a glowing tribute to Robert William Smith, an illustrious Irishman, who had filled this post twenty years before. He then reviewed the achievements of the Dublin branch of the British Medical Association, and spoke in very complimentary terms of the journal of the Association.

In an address of this kind the mind instinctively turns to retrospect of the improvements of surgery. A prominent position must be accorded in this Victorian era to the *antiseptic system of surgery*, still enveloped in the clouds of uncertainty and misconception, notwithstanding the work which so many eager and enthusiastic admirers have bestowed upon it. The system may be wrong in practice and founded on an erroneous theory, but it has spread throughout the civilized world, and that wonderful results have followed it cannot be denied. Yet we find some of its most devoted adherents abandoning parts of the system long considered as essential,—and that, too, without diminution of results. Again, we find antiseptic precautions so little regarded—nay, almost set at naught—as to prompt the ovariotomist to flush the peritoneum with water containing "germs and spores and thirty different kinds of beasts," and yet point to a continuous record of success little, if any, inferior to the more complex method. What can the simple inquirer after truth arrive at?

It may be conceded as proved that the atmosphere which surrounds our globe is infested with myriads of minute organisms subject to constant and restless change. These changes are largely influenced, if not caused, by their surroundings, and they again produce disturbance in their surroundings. Some of these can only develop in material which is dead, and are therefore amenable to physico-chemical laws. Others, again, are capable of living in tissue which is alive, where they increase and multiply, disarranging and vitiating the whole organism. In the first variety the effect produced is in direct proportion to the actual amount of the ferment introduced. In the second the amount of disturbance produced is out of all proportion to the minute quantity of the noxa which causes it. That the latter bodies are potent factors in suppuration and infective inflammation would appear to be proved beyond a doubt. Experiments have proved that injury may be produced, either mechanical or physical, on the deep tissues of the living body, and, if due cleanliness of the instruments be observed and atmospheric air absolutely excluded, no effect whatever is produced beyond the injured spot. The hot iron or injections of strong solutions of chloride of zinc kill the tissues, but the necrosed mass produces no ill effect on the surrounding structures.

It is certainly our duty to destroy and exclude from the body all these micro-organisms, and if the means adopted for that purpose—call them Listerism, antisepticism, surgical cleanliness, or by whatever name you will—turn the scale a feather-weight in favor of restoration to health or saving the life of a single human being, the man who refuses to employ them through apathy or prejudice incurs a responsibility nothing short of criminal.

A suitable germicide is now the object of pathologists and chemists. It is interesting to watch now one, now another, lauded and proclaimed, only to be superseded by a new claimant. Carbolic acid, corrosive sublimate, iodoform, thymol, have each for a time worn the crown, only in their turn to be deposed and dismissed as impostors.

Up to the present the attention has been almost exclusively fixed upon infective germs, sufficient regard not having been paid to the important influence of environment. We know that these atoms, no matter how virulent they may be, cannot undergo their life-changes, cannot produce their infective results, unless the environment, like the cultivation-liquids of the histo-pathologist, is capable of developing and sustaining this change. Deposited on a clean glass, metal, or porcelain, they die of inanition; they exercise no influence whatever, and are amenable to none. In contact with dead organic matter, or living matter in certain conditions of altered or reduced vitality, they become a teeming source of infection, decomposition, and decay. If we bring pathological surfaces to such a condition that they do not afford a suitable cultivation-ground, do we not accomplish as much as when we destroy them? Surely the perfection of antisepticism must be attained when these two conditions are fully developed and enforced.

The protection of vaccination against small-pox and the protection of the blood by the previous action of the exanthemata are examples of the influence of environment. The bacilli of splenic fever, so destructive to the herbivorous animals, take little effect on carnivora, and none at all on the pachydermata. The bacteria which will cause septicæmia in the mouse are wholly inert in the field-mouse. If we study human by comparative pathology, we learn much. Look at the flood of

light which has been shed by the study of splenic fever, chicken cholera, and of glanders; or by Pasteur's discovery of the *Pébrine* in the silkworm. We can learn much from the pathology of the vegetable kingdom. Some of the most troublesome diseases which the surgeon has to deal with are caused by the invasion of vegetable parasites. Fruit can be ripened with almost mathematical precision by interposing between specimens fully-ripened fruit of the same species, just as if the emanations from the ripe fruit produced a ripening influence upon the fruit in its immediate vicinity. I think we see this principle of environment frequently illustrated in human pathology when disease extends to adjacent but not continuous surfaces.

This twofold aspect of chronic inflammation was forced on my attention by trying to think out the best mode of dealing with chronic abscess. The discharge from a recently-opened abscess does not show any of these micro-organisms which are so characteristic of purulent matter in acute suppuration.

The treatment of open wounds by a solution of the chloride of zinc, the method introduced by the late Campbell de Morgan, has been the treatment of my colleagues and myself at Steevens Hospital for over twenty years. This has no rational foundation in histo-pathology, yet our faith in the practice cannot be shaken by the dictum of even so high an authority as Koch, who asserts that chloride of zinc is inert as a germicide, and much less effective than corrosive sublimate, iodine, or carbolic acid. I firmly believe that it will render a cut surface a barren cultivation-field, and I think we can infer that it will produce a similar effect on the wall of an abscess.

My method of proceeding is the following. A long curved trocar and canula is pushed through the abscess, and made to transfix it some four or five inches; a piece of rubber tubing, with a single hole about the centre, is then drawn through the canula by a thread connected with the cutting-end of the trocar; the aperture in the tubing being lodged midway between the trocar-wounds, the canula is removed. One end of the tube is attached by glass tubing to the exit-conduit of an irrigating can hung well above the patient's bed, the other end discharges into a reservoir at the bedside; by means of a stop-cock the flow of liquid may be regulated with greatest nicety, so that it can escape drop by drop, and render not only the contained fluid but the abscess-wall perfectly aseptic. Again, by compressing the exit-portion of the tube between the thumb and finger you can cause distention of the sac to any degree desirable, and thus produce all the advantages of the distention method proposed by Mr. Callender. And now as to the fluid which is to be used for irrigating an abscess. In my earlier trials I of course employed the fashionable antiseptic, carbolic acid, but my patients, after a few hours, exhibited olive-colored urine and gastric disturbance, warning me that I could not persist without reducing the strength of the solution to such a degree as to render it inert. Subsequently I employed a very weak solution of chloride of zinc (one part to two hundred) with the best possible results. The cavity remained antiseptic; remarkable changes were developed in the wall of the abscess; thin, membranous matter was discharged from time to time. After about a week the sinuses through which the tubes were passed became enlarged, so as to be no longer watertight. This at first caused considerable trouble in keeping the patient dry and comfortable, but more extended experience proved that at this time continuous irrigation is not needed, the cyst-wall having undergone such decided alteration in its structure that occasional syringing is quite sufficient for the perfect healing of the cavity. Such, Mr. President and gentlemen, is the treatment of chronic abscess by irrigation.

In conclusion, fellow-laborers of the British Medical Association who are engaged in surgical work, we have committed to us a goodly heritage. This Victorian age in which we live has been signalized by some most remarkable advances in all the arts and sciences. Human intellect and inventive faculties, day after day, gain fresh triumphs over matter, but in none have greater strides been made than in the art and practice of surgery, more especially in those lines where it is being extended by a more careful application of anatomy and physiology. It is true that in this country experimental research, which has done so much to relieve human suffering and save human life, is cribbed, cabined, and confined within the four corners of an Act of Parliament which is a reproach to the common sense of that august assembly, and an outrage on the characters of the members of a profession who, whatever may be their faults and failings, have never been obnoxious to the charge of cruelty or disregard of suffering or pain. The hysterical shrieks of a few women and the puling sentimentality of some weak-minded men have placed and retained in the statute-book the Vivisection Act. *Tu quoque* is, I believe, a bad defence, but we see them mount their horses and hunt to death the timid hare and clever fox. I should be sorry, indeed, to say a word against field-sports, which have no doubt their useful purpose. I only ask for consistency, and that scientists in this country should not be placed at so great disadvantage compared with their Continental brethren.

We must, however, make the best use of the means at our disposal, and carry forward the standard of investigation into new and unexplored fields. One by one the dark caverns of the body are being illumined by the light of scientific surgery; even the ivory

walls which guard and protect the dome of thought are pierced by its rays, and the brain itself mapped out with geographical precision, as in a chart, so that we can, by careful reading of the symptoms, place our fingers on the very spot oppressed by injury or disease, and by a bold and decisive operation lay it bare and remove the cause of its morbid condition or disturbed function. There still is ample room and verge enough for work,—many untrodden fields of discovery; so that the future of Queen Victoria's reign may be made as glorious in the annals of scientific discovery, and as full of help to the sick and wounded sufferer, as it has been in the past.

(To be continued.)

REVIEWS AND BOOK NOTICES.

A System of Gynecology by American Authors. Edited by Matthew D. Mann, A.M., M.D. Vol. I. Illustrated with Three Colored Plates and Two Hundred and One Engravings on Wood. Philadelphia, Lea Brothers & Co., 1887. Sheep, 8vo, pp. 789.

The contents of the first volume of this "System of Gynecology" are as follows: "A Historical Sketch of American Gynecology," by Edward W. Jenks, M.D.; "The Development of the Female Genitals," by Henry J. Garrigues, M.D.; "The Anatomy of the Female Pelvic Organs," by Henry C. Coe, M.D.; "Malformations of the Female Genitals," by Henry J. Garrigues, M.D.; "Gynecological Diagnosis," by Egbert H. Grandon, M.D.; "General Consideration of Gynecological Surgery," by E. C. Dudley, M.D.; "General Therapeutics," by Alexander J. C. Skene, M.D.; "Electricity in Gynecology," by Alphonso D. Rockwell, M.D.; "Menstruation and its Disorders," by W. Gill Wylie, M.D.; "Sterility," by A. Reeves Jackson, M.D.; "Diseases of the Vulva," by Matthew D. Mann, M.D.; "The Inflammatory Affections of the Uterus," by C. D. Palmer, M.D.; "Sub-Involution of the Vagina and Uterus," by Thaddeus A. Reamy, M.D.; "Peri-Uterine Inflammation," by Richard B. Maury, M.D.; and "Pelvic Hæmatocele and Hæmatomata," by Ely Van de Warker, M.D.

The several topics considered in this volume are treated not only in a manner consistent with the reputation of the several authors, but also—what is more rare in a work of this character—in a style remarkable for condensation and lucidity of statement. This System is worthy of unqualified praise, and if the succeeding volumes fulfil the promise of the first, it will be an honor to American gynecology, and indispensable to every physician who wishes to keep himself *au courant* with this rapidly-developing department of medicine.

NEW REMEDIES AND CLINICAL NOTES.

Hyoscine, according to Chéron, appears likely to supplant the older mydriatics, the effect being produced in ten minutes by the use of a few drops of a solution made in the proportion of one to a thousand.

Pill for Diabetes of Arthritic Origin.

℞ Lithii carb., 10 centigrammes;
Sodii arseniatis, 3 milligrammes;
Ext. gentianæ, 5 centigrammes. M.
Ft. pilulæ.
Take morning and night.—*Vigier.*

Cannabis Indica for Dysentery and Summer Diarrhœa.—The value of cannabis indica in dysentery is recognized in India, and Dr. S. J. Rennie, of Cawnpore, calls attention to it in an interesting communication to the *Indian Medical Gazette* last December. In sporadic cholera, a combination was suggested by Dr. Turner (*Lancet*, vol. ii., 1886), which he had also found useful in ordinary summer diarrhœa:

℞ Tr. cannabis indicæ,
Spiritus chloroformis, āā ♏ x;
Tincturæ kino, f℥j;
Aquam menthæ piperitæ, ad ℥j.

This has been given in all forms of diarrhœa occurring during August and September in a large dispensary, and its superiority over all the other remedies commonly used was very evident. Frederick F. Bond, M.D., and B. E. Edwards, M.B., in the *Practitioner*, extol this remedy, and prefer to combine with it a small quantity of morphine. The formula usually adopted for an adult is:

℞ Tincturæ cannabis indicæ, ♏ x;
Liq. morphinæ (Br.), ♏ v–x;
Spiritus ammonii aromatici,
Spiritus chloroformis, āā ♏ xx;
Aquam, ad f℥j. M.

To be repeated every one, two, or three hours, according to circumstances. During this period or for several hours no food is to be taken by the patient, but a little brandy-and-water. Under this treatment no cases reached a fatal issue. It is of only temporary value in tuberculous diarrhœa or in the excessive diarrhœa of typhoid fever.

MISCELLANY.

Common Forms of Adulteration in Coloring-Materials used by Confectioners and Bakers.—As a result of recent discovery of the use of chromate of lead as an artificial "egg-coloring" for cakes, public attention has been called to the subject of coloring-materials used in the trade. The American Society for the Prevention of Adulteration in

Food had just issued a circular to bakers and confectioners with reference to articles averred to be in common use:

"You are hereby notified that the enumerated colors herein are poisonous, and if you persist in the use of any of them after receipt of this notice you will be prosecuted to the full extent of the present law:

"*Common and Poisonous Colors.*

Common Name.	*Chemical Name.*
YELLOW.	
King's yellow	Sulphide of arsenic.
Cadmium yellow	Sulphide of cadmium.
Turner's yellow	Oxychloride of lead.
Turpeth mineral	Basic sulphate of mercury.
Chrome yellow	Chromate of lead.
Chrome zinc	Chromate of zinc.
Citron yellow	Chromate of barium. Chromate of strontia.
Naples yellow	Oxides of lead and of antimony.
Yellow ochre	Clay and hydrated ferric oxide.
Mosaic gold	Sulphide of tin.
RED.	
Minium	Oxide of lead.
Vermilion	Sulphide of mercury.
Purple red	Basic chromate of mercury.
Iodine scarlet	Mercuric iodide.
Realgar	Sulphide of arsenic.
Red ochre, Colcothar	Ferric oxide.
GREEN.	
Chrome green	Chromic oxide.
Cobalt green (Rimmam)	Oxides of cobalt and of zinc.
Mountain green	Malachite green.
Scheele's green	Acetate of arsenite of copper.
BLUE.	
Ultramarine	Silicate of alumina and soda with sulphide of sodium.
Mountain blue	Malachite blue.
Smalts	Silicate of cobalt and potassium.
Antwerp blue, Insoluble Prussian blue	Ferric ferrocyanide.
Soluble Prussian blue	Ferro-potassic ferrocyanide.
Indigo	
BROWN.	
Manganese brown	Binoxide of manganese.
Vandyke brown	Ferric oxide.
Burned sienna, Burned umber	Clay colored with oxide of iron and manganese.
ORANGE.	
Chrome orange	Basic chromate of lead."

INTERNATIONAL MEDICAL CONGRESS.—Preparations are on foot to entertain delegates to the International Medical Congress who may wish to visit Philadelphia before going to Washington. On the Saturday preceding the opening of the Congress an informal reception and clinic will be held at the Pennsylvania Hospital, under the charge of Dr. T. G. Morton. A Committee of Arrangements has been appointed, with Professor William H. Pancoast as Chairman, some members of which will be in attendance at the St. George Hotel, in this city, morning and evening, in order to give information relative to the meeting of the Congress to those who desire it. The hotels offer reduced rates to delegates.

ACTION OF THE SUN'S RAYS ON GLUCOSE.—At a meeting of the French Academy of Sciences, M. Pasteur referred to some recent researches by M. Duclaux on the decomposition of sugar by the rays of the sun. This investigator had observed that when an alkaline solution of glucose, either in contact with the air or completely protected from the atmosphere, was exposed to the action of the solar rays, decomposition took place without the intervention of any ferment. Carbonic acid and alcohol were produced in just the same proportion as when sugar is fermented by yeast. This observation, although of no great practical importance, is of considerable scientific interest.—*Zymotechnic Magazine.*

COLOR-BLINDNESS AMONG ENGINEERS.—A peculiar phase of the labor problem was recently manifested in this city in a strike of the Reading Railroad train-men against an examination for color-blindness. It was found that some of the engineers in charge of night trains were seriously defective in their power to recognize or distinguish colors. The railroad authorities refused to yield, and the question was finally refused to be settled by arbitration.

COMPLIMENTARY BANQUET.—The personal friends of Dr. J. M. Barton tendered him the compliment of a dinner of fifty covers at the St. George Hotel on the 9th instant, to celebrate his safe return from abroad.

THE *Nashville Medical News* has been discontinued.

NOTES AND QUERIES.

OBITUARY.

DEATH OF MR. WILLIAM G. MALIN.—From the debilitating effects of the heat, acting upon a physical frame already weakened by the infirmities of advancing age, died, on the 2d instant, Mr. William Gunn Malin, who, in the capacity of Clerk, Librarian, and Steward, faithfully served the Pennsylvania Hospital for the period of fifty-nine years. In 1824 he was appointed clerk to the hospital. In 1883 he was retired from active duties, and by resolution of the Board of Managers he was invited to make his home in the institution during the remainder of his life. Shortly afterwards a complimentary dinner in recognition of his long and faithful service was given to him by the ex-resident physicians, at which the managers, medical staff, and many invited guests were present. On this occasion his life-size portrait in oil was presented to the hospital. He had decided literary tastes, and made a fine collection of books relating to the history of the Moravian Church, which he presented to the Moravian Society at Bethlehem, Pennsylvania. Of late his health had been evidently failing. He was greatly respected by all who came in contact with him, and had many friends, chiefly among the older resident physicians and managers.

OFFICIAL LIST

OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U.S. MARINE HOSPITAL SERVICE FOR THE TWO WEEKS ENDING AUGUST 6, 1887.

IRWIN, FAIRFAX, PASSED ASSISTANT-SURGEON.—To inspect unserviceable property at New York Marine Hospital, August 5, 1887.

CARTER, H. R., PASSED ASSISTANT-SURGEON.—Granted leave of absence for six days, August 1, 1887.

BEVAN, A. D., PASSED ASSISTANT-SURGEON.—Granted leave of absence for ten days, August 5, 1887.

NORMAN, SEATON, ASSISTANT-SURGEON.—Granted leave of absence for four days, on account of sickness, August 5, 1887.